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DETERMINATIONS OF PROPER MOTION

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VOL. XII, PART I

PROPER MOTIONS OF FAINT STARS

BY GEORGE C. COMSTOCK,
DIRECTOR.

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1908.

The Washburn Observatory,

FOUNDED BY

Cadwallader C. Washburn.

Born 1818; Died 1882.

INTRODUCTION.

In Vol. X of the *Observations de Poulkova* Otto Struve has published a series of proper motions of faint stars derived from micrometric comparison of these stars with neighboring bright ones of known proper motion. Some of these stars are as faint as the twelfth magnitude and, so far as I am aware, this list represents the first attempt ever made at determining the motions of stars of this class, or indeed of any class fainter than the ninth magnitude. But small heed seems ever to have been paid to these determinations, and they cannot be considered to have produced any effect upon current views of the structure of the stellar system, although they furnish precisely the kind of data most needed for this purpose. Indeed, it is not feasible from an inspection of the published data to determine whether the resultant proper motions are real quantities, or are merely residual errors of observation and of the assumed reduction elements. For the most part they depend upon micrometric observations at only two epochs, separated by an interval of about a quarter of a century, and the assumed proper motions of the bright comparison stars are far from corresponding to the best data now attainable. The method, however, has seemed to me sufficiently promising to warrant further attempts at its application, and as the elapsed time interval separating the present epoch from that of the earlier observations of these stars by the Struves amounts on the average to something more than half a century, I have repeated with the 40 cm. equatorial of the Washburn Observatory the micrometric measures of all these stars fainter than the ninth magnitude, for which suitable early observations are available, and I have added to the list a considerable number of other stars for which suitable early observations are extant. The individual observations of all these stars are set forth in Table I, whose arrangement seems to call for little explanation.

The observations have been made with the instrument and by the methods employed in my previous observations of double stars and reference may be made to Vols. VI and X, Publications of the Washburn Observatory, for an account of these and for a statement of the instrumental constants, etc. With rare exceptions each observation has been accompanied by an estimate of the magnitudes of the stars, but as these magnitudes for the most part have been made the subject of special investigation elsewhere, I refrain from printing these estimates. In the case of stars fainter than the eleventh magnitude, however, the estimates are printed in Table I, since other data are not so readily obtainable. The adopted value of a revolution of the micrometer screw is that determined in connection with

the Eros observations, Vol. X, Part 2, and corrections for the progressive error of the screw have been taken from the table there given, and applied in all cases where sensible. The periodic errors of the screw are inappreciable.

DETERMINATION OF THE PARALLEL. DIFFERENTIAL REFRACTION.

Expressions for the effect of differential refraction upon an observed position angle and distance may be found in the text books, e. g., Chauvenet, Spherical and Practical Astronomy, Vol. II, p. 457, but it should be noted that the corrections there given are derived for the case in which the observed position angle is referred to the apparent direction of the parallel or hour circle; i. e. the formulae presuppose that for each star the parallel is determined simultaneously with the position angle. I am not aware that this mode of observing is followed by any astronomer, at all events my own practice has been to treat as an instrumental constant the reading of the position circle, P_0, corresponding to the true direction of the hour circle and in general to determine the value of this constant once on each night, using for this purpose my method of transits over inclined threads, set forth in the *Bulletin du Comité International Permanent pour l'exécution photographique de la Carte du Ciel, Tome III.* In all strictness, the value of P_0 is not constant but varies slightly as the telescope is turned from one part of the sky to another, through the effect of flexure and of errors in the adjustment of the axes. In view of the relatively large distances here measured, e. g., 400″, an unusually precise determination of the parallel is required, and I have therefore followed the plan, so far as practicable, of concentrating the observations of each night within a limited area of the sky, defined by fixed values of the declination and hour angle, and determining the parallel for this region from, or near to, the widest double star observed on the night in question. When it has been necessary to observe in widely different parts of the sky upon the same night, I have either made supplementary determinations of the parallel or have interpolated a value from observations made on other nights. See Publications of the Washburn Observatory, Vol. X, Part 2, p. 8, in illustration of the stability of the values of P_0 and the considerable precision attainable in its determination by the methods here employed. The probable error of a single determination is approximately ±1′.

Each observed value of the parallel was corrected for the effect of differential refraction through the relation,

$$\Delta P_0 = -\rho\mu \sec\delta \cot n \cos N \operatorname{cosec}^2 (N+\delta) \tag{1}$$

Where N, $\cot n$, are Bessel's auxiliaries, ρ is the constant factor, 3438, required to express ΔP_0 in minutes of arc, and μ is the refraction coefficient, whose value is to be derived from the following table with the star's true zenith distance, z, and the temperature of the air, in degrees C, as arguments.

$$\log \mu = a + b$$

z	a	Temp.	b
0°	8.884	−20° C	7.600
20	.884	−10	.583
40	.883	0	.567
60	.882	+10	.551
70	.879	+20	.536
80	.864	+30	.521

The values of μ given by this table are based upon the Pulkowa refractions and correspond to the mean barometric pressure at Madison, i. e. 735 mm.

I have in general assumed that the differential refraction is insensible for stars separated by a distance less than 20″. For distances greater than this limit I have applied to the observed position angle, p, and distance, s, a refraction correction furnished by the following expressions:

$$\begin{aligned} \tan \psi &= \tan z \cos (q - p) \\ \Delta p &= + \rho\mu \tan^2\psi \tan (q - p) \\ \Delta s &= + s\mu \sec^2\psi \end{aligned} \qquad (2$$

where q and z denote the parallactic angle and zenith distance of the star in question and ρ and μ have the significance above defined. These corrections are included in the printed values of p and s.

The equations printed above furnish the following precepts which I have found convenient as rough criteria of those cases in which the refraction effect may be ignored:

REFRACTION IN POSITION ANGLE.

This refraction effect vanishes whenever the arc, s, joining two stars is vertical or horizontal. Its maximum value is obtained when s makes an angle of 45° with the vertical and this maximum value rises from 0 at the zenith, to 1′ in $z = 57°$ and 15′ in $z = 80°$.

REFRACTION IN DISTANCE.

The minimum value of this effect obtains when the arc s is horizontal, the maximum when s is vertical. In all parts of the sky the minimum value of Δs equals $s \div 4000$. The maximum value of Δs at the zenith equals the minimum value and increases to $s \div 1000$ at $z = 57°$ and $s \div 100$ at $z = 80°$.

PRECISION OF THE OBSERVATIONS.

Each observed position angle, save in abnormal cases, depends upon six settings of the position circle, for three of which the reading was taken from the A vernier and for the remaining three from the B vernier. Similarly each observed distance depends upon six settings of the micrometer threads, three double distances. To derive a numerical measure of the internal consistency of the data thus furnished I have discussed about 500 residuals furnished by stars observed three or more times and find the following probable errors of a single result as above defined.

PROBABLE ERROR AS A FUNCTION OF DISTANCE.

Limits of Distance.	Mean Distance.	P. E. of a Position Angle.		P. E. of a Distance.
		In Angle.	In Arc.	
″ ″	″	′	″	″
4 — 8	6	± 46.	± 0.08	± 0.09
10 — 50	29	15.8	.13	.12
100 — 200	155	4.4	.20	.16
200 — 400	260	2.6	.20	.17

It is evident from this exhibit that the precision of the observations diminishes with increasing distance between the stars, but that at all distances it is fairly comparable with the better class of heliometer work as shown in the following table of probable errors of a single result, "*Abendwerth*," constructed from the publications of the observers named;

Observer	P. E.
	″ ″
Gill	± 0.07 to ± 0.12
Elkin	.11 .35
Chase	.14 .23
Peter	± 0.12
Schur	± .16

See also Astr. Nachr. No. 3107, for an exhibit of the probable errors of heliometer work, by Gill, less favorable to the measure of precision of such observations.

It is evident from the above table that the precision of my observing is substantially the same in both coordinates and that the probable error of a computed rectangular coordinate, $A = s \sin p$ or $D = s \cos p$ derived from the mean of n observations may be assumed on the average to be $\pm \frac{\varepsilon}{\sqrt{n}}$ where as is shown above ε ranges

from ± 0.″08 to ± 0.″20, depending upon the distance *s*. It is shown hereinafter from a discussion of the proper motion residuals that the probable error of such a coordinate, based upon an average of 2.7 observations, is for the present work ± 0″.10. This last result is based upon a comparison of my observations with those of many other astronomers and includes the hypothesis of rectilinear motion of the stars; the former results for probable error are based solely upon internal discordances of my own data and the agreement between the values thus obtained is sufficient to inspire some confidence in them as genuine criteria of precision. See a following page for a discussion of the probable errors of other observers.

Assuming that the degree of precision thus shown is typical of similar work done elsewhere it follows as a corollary that the practice adopted by some astronomers of giving observed position angles to the nearest tenth of a degree only, is not a proper one to pursue when the distances exceed 50″ or 60″.

RELATIVE MOTION OF THE STARS.

A determination of the relative motion of the stars must depend mainly upon a comparison of ancient with modern observations. For the required early data I have relied almost exclusively upon the observations of W. Struve and O. Struve, made in the quarter century following 1830, while as modern data I have employed my own results here published, supplemented in some measure by other material nearly contemporaneous with my own. The abundant data contained in Burnham's General Catalogue of Double Stars was, unfortunately, not available at the time most of the computations were made and is therefore not largely utilized. In discussing the proper motions, I have combined with the foregoing data a sufficient number of intermediate observations to furnish a control upon the assumed linear character of the relative motion of the stars, but I have made no attempt to discuss all of the available observations, since most of them fall near the mean epoch of the earlier and later data, and would add very little to the weight of the resulting proper motions. I have therefore limited myself, for the most part, in the selection of intermediate data to the observations of Dembowski, Hall, Burnham and the Pulkowa observers.

In every case the mean of the position angles measured by a given observer during a brief period (one to four years) was reduced to the epoch 1850.0 and was then combined with the corresponding mean of the observed distances to furnish the rectangular coordinates, A, perpendicular, and D, parallel, to the hour-circle. The weights of these computed coordinates were assumed to be independent of the observer, and to be functions solely of the number of individual observations entering into the adopted mean position angle and distance, in accordance with the following scheme:

No. of observations	Assumed weight
1	0.5
2 to 10	1.0
More than 10	2.0

Cases in which the weight 2.0 was assigned are extremely rare. In a few cases an observation that was obviously erroneous was assigned weight 0.

If we denote by A′ and D′ the centennial variations of A and D and represent by V the mean epoch of observation each star will furnish a pair of equations of the form

$$A_0 + A' \, (T - V) = A$$
$$D_0 + D' \, (T - V) = D \qquad (3$$

and a least square solution of a group of such equations will furnish A′ and D′, which are the quantities most desired, together with A_0 and D_0, the values of the coordinates at the epoch V, which are to be reduced to the fundamental epoch, 1850.0, by means of the motions A′ and D′. These solutions have not been made in the conventional form but through the following group of equations which is equivalent to it, where p represents the weight assigned to the observation.

$$V = [pT]/[p] \qquad \tau = T - V$$
$$A_1 = [pA]/[p] \qquad A' = [p\tau\,(A - A_1)]/[p\tau\tau] \qquad A_0 = A_1 + A' \, (1850.0 - V) \qquad (4$$
$$D_1 = [pD]/[p] \qquad D' = [p\tau\,(D - D_1)]/[p\tau\tau] \qquad D_0 = D_1 + D' \, (1850.0 - V)$$

The quantities $[p]$ and $[p\tau\tau]$ are, of course, the weights with which A_1, D_1, A′, D′ are respectively determined.

MASSES OF BINARY STARS.

In a considerable number of instances the formation of the quantities A, D, was complicated by the circumstance that one of the stars involved was in itself double. In such cases the coordinates employed should relate to the center of gravity of the binary system and in a few cases, e. g., 70 Ophiuchi, 85 Pegasi, it has been found possible to determine from the available data the relative masses of the stars and thus fix the position of their center of gravity. In the case of micrometric observations of a third star, C, referred to one of the components, A, of a binary system we represent by p_1, s_1 the position angle and distance of B referred to A; by p_2, s_2 the corresponding coordinates of C referred to A, and denote by k the ratio of the mass of B to the combined mass of A + B. The coordinates of A referred to the center of gravity of the system A B are then, $-k\, s_1 \sin p_1$, $-k\, s_1 \cos p_1$, and presuming that s_1, p_1 can be obtained for any required date from the known apparent orbit of the binary star, each observation of C furnishes a pair of equations of the form,

$$A_0 + A'\tau + s_1 \sin p_1 \,.\, k = s_2 \sin p_2$$
$$D_0 + D'\tau + s_1 \cos p_1 \,.\, k = s_2 \cos p_2 \qquad (5$$

where A_0, D_0, are the unknown coordinates of C referred to the center of gravity of A B at any assumed epoch, τ is the elapsed time reckoned from this epoch and A′, D′ are defined above. The solution of two groups of equations, in A and D respectively, will determine independent values of k, whose agreement or discordance will furnish some criterion of their reliability. From the nature of the problem the value of k, if a real quantity, must fall between the limits 0 and + 1; any value outside these limits denoting an illusory solution.

The introduction of a third unknown quantity, k, into Equations 3 and 4, renders inapplicable the form of least square solution given above, but with suitable modi-

fication that form may be applied as follows: Let c represent the coefficient of the third unknown, k, and compute the following auxiliaries:

$$m = [pc]/[p] \qquad v = [pcc] - m\,[pc] - n\,[p\tau c]$$
$$n = [p\tau c]/[p\tau\tau] \qquad w = [pc\,(A - A_1)] - n\,[p\tau(A - A_1) - m\,[p\,(A - A_1)] \tag{6}$$

In terms of these quantities we may find for the A coordinate,

$$V = [pT]/[p] \qquad A_1 = [pA]/[p] \qquad k = w/v$$
$$A' = [p\tau\,(A - A_1)]/[p\tau\tau] - nk \qquad A_0 = A_1 - mk - A'(V - 1850) \tag{7}$$

Entirely similar expressions obtain for the D coordinate. The quantity v here represents the weight with which k is determined and the weight of A′ is given by the expression $[p\tau\tau]v/v'$ where v' denotes the first two terms in the value of v. These formulae have been occasionally employed.

Reliable values of k can in general be obtained only when observations of C extend over a large fraction of the periodic time of A B, and in the rather common case in which this condition is not satisfied I have somewhat arbitrarily put $k = \frac{1}{2}$ as the most plausible assumption with respect to the masses that can be made at the present time, and have therefore adopted the point midway between A and B as the origin to which to refer the coordinates of C. To pass from the measured polar coordinates of B and C referred to A, s_1, p_1, s_2, p_2, respectively, to the corresponding coordinates, $s_0\,p_0$, of C referred to $\frac{1}{2}$ (A + B) I have employed the following formulae:

Put $$2\,\lambda = s_1 \sin (p_1 - p_2) \qquad 2\,\mu = s_1 \cos (p_1 - p_2)$$
$$\tan \tau = \lambda/(s_2 - \mu) \tag{8}$$

and in terms of these quantities find,

$$p_0 = p_2 - \tau \qquad s_0 = s_2 - \mu - \mu^2/2s_2 \tag{9}$$

In a few cases the formation of the spherical coordinates A, D has been further complicated by the effect of a sensible parallax of the comparison star A. When necessary I have taken this into account by adding to the computed values of A and D, corrections given by the following group of equations in which π represents the assumed parallax of the comparison star, α and δ are the right ascension and declination of this star, and α_1, δ_1 the corresponding coordinates of the sun.

Put $$h \sin \psi = \sin \delta_1$$
$$h \cos \psi = \cos\delta_1 \cos (\alpha_1 - \alpha) \tag{10}$$

and in terms of these quantities find

$$\varDelta A = + h\pi \cos \psi \tan (\alpha_1 - \alpha)$$
$$\varDelta D = + h\pi \sin (\psi - \delta) \tag{11}$$

Strictly, the second members of these equations should contain the radius vector of the earth, R, as a factor, but I have uniformly neglected the eccentricity of the earth's orbit and assumed R = 1.

PRECISION OF THE DATA.

For each least square solution there was formed the residual v corresponding to each equation, and the sum of the weighted squares of the residuals, $[pvv]$. The accuracy of the numerical work was controlled through the following "check" relations in each coordinate:

$$[p\tau] = 0 \qquad [pv] = 0.$$

I have used the residuals thus obtained to determine the probable error of an equation of unit weight, treating separately the data for the A and D coordinates. I find thus from 570 residuals, in each coordinate,

$$\text{In } A, \quad r_1 = \pm\, 0''.153 \qquad \text{In } D, \quad r_1 = \pm\, 0''.131.$$

The small difference between these numbers is unquestionably a real one and corresponds well with the general impression that an equatorial telescope is more stable in declination than in right ascension and that this difference of stability is reflected in the relative precision of the observations.

From the values of r_1 thus found there has been constructed the following table by which to pass from the weight, p, with which any coordinate or relative proper motion is determined, to the corresponding probable error of the quantity.

TABLE A.

WEIGHTS AND PROBABLE ERRORS OF THE RELATIVE MOTION.

Weight.	Probable Error.	
	A or A′	D or D′
	″	″
0.02	± 1.08	± 0.93
.04	0.77	.65
.06	.63	.53
.08	.54	.46
.10	.48	.41
.15	.39	.34
.20	.34	.29
.50	.22	.18
1.00	.15	.13
5.	.07	.06
10.	.05	.04
100.	.02	.01

From an inspection of Table I it may be seen that the weight corresponding to a centennial proper motion usually falls between the limits 0.1 and 0.4, corresponding to the probable errors, ± 0″.5 and ± 0″.2. The corresponding limits of probable error of a coordinate A or D at the mean epoch of observation are ± 0″.13 and ± 0″.04.

I have discussed separately the residuals furnished by the observations of those astronomers who have contributed most largely to the present work, and the results of this discussion are contained in the following table, where the symbol r_1 (Eq.) denotes the probable error of an equation of unit weight, and r_1 (Obs.) the probable error of a single observation, without discrimination between the A and D coordinates. The latter number is derived from the former through an approximate consideration of the average number of single results (one night) incorporated into a mean for each observer.

Observer.	No. of Residuals.	r_1 (Eq.)	r_1 (Obs.)
		″	″
W. Struve	144	± 0.13	± 0.22
O. Struve	378	.14	.23
H. Struve	48	.17	.23
Doubiago	24	.20	.31
Dembowski	152	.13	.24
Hall	64	.14	.24
Burnham	72	.18	.26
Comstock	228	.10	.18

The numbers given in the last column of this table are functions not only of the skill and care of the observer but also of the character of his instrument, his normal atmospheric conditions and the magnitude of his personal peculiarities of observation, e. g., systematic error. In view of these considerations and others that might possibly be suggested, the uniformity of the numbers, r_1 (Obs.), is more pronounced that could have been expected *a priori* and constitutes a justification for the equal weight assigned to the several observers.

It will be understood that all of the above numbers are mean values of the probable error and that with varying classes of stars the probable errors present a considerable range of values, the precision diminishing slowly with increasing distance and falling off very rapidly for faint stars near the limit of visibility. See the tabular exhibit of this effect given on p. 6 and compare the probable errors there formed from a discussion of the internal consistency of my own observations with the probable errors here derived from a comparison of the observations of different astronomers, whose work covering a period of more than half a century is linked together by the assumed linear motion of the stars.

A following table, Table I, shows for each star under investigation, the data employed and the resulting motion in each coordinate. The first column contains

a current number representing the star whose motion is to be determined, and a name or other symbol for the bright star with which it has been compared. The second column contains a symbol for the observer whose data are employed, and I have here used the following abbreviations:

Σ =F. G. W. Struve	Big.=Bigourdan
$O. \Sigma$ =Otto Struve	Flam.=Flammarion
Doub.=Doubiago	Kn.=Knorre
Δ =Dembowski	Eng'h.=Engelhardt
Win.=Winnecke	β =Burnham
HΣ =Herman Struve	Lv.=Leavenworth
Hl.=Asaph Hall	Ho.=Hough
Sp.=Schiaparelli	Hu.=Hussey
Gl.=Glasenapp	A.=Aitkin
Du.=Dunèr	Doo.=Doolittle
Seag.=Seagrave	C.=Comstock

The third column shows the number of observations that have been united to form a mean value. The fourth column gives the date corresponding to this mean. The fifth column gives the mean value of the position angle, at this date, referred to the equinox of 1850.0. The sixth column contains the corresponding mean distance of the stars in seconds of arc. The seventh and eighth columns give respectively the residuals in A and D furnished by the least square solution of the data. The last column, in addition to miscellaneous remarks, gives the weighted mean epoch of observation, V. Below the data for each star is given the resulting expression for each coordinate as a function of the time, T, reckoned in centuries from the epoch 1850.0; viz:

$$A = A_0 + A' \ (T - 1850)$$

$$D = D_0 + D' \ (T - 1850)$$

Immediately below the quantities A_0 and D' there is printed the weight with which these are respectively determined, i. e., $[p]$ and $[p\tau\tau]$. From the nature of the solution it follows that these weights apply equally to both coordinates, the weight of D_0 being the same as that of A_0, and the weight of A' the same as that of D'.

PROPER MOTIONS OF THE BRIGHT COMPARISON STARS.

So far as possible the assumed proper motions of the comparison stars have been taken from Newcomb's Fundamental Catalogue and, in fact, a little less than one half of them have been thus obtained. For the remaining stars I have myself determined the proper motions from a least square discussion of the available cata-

logue places, following Newcomb's methods and using his systematic corrections and weights as far as applicable. In a few cases I have, for special reasons, redetermined the proper motions of stars contained in the Fundamental Catalogue or have substituted for Newcomb's proper motions those given by Auwers, *Astr. Nach. 3509*, reducing the latter to Newcomb's system. I have to acknowledge the very considerable assistance rendered me in this connection by Dr. Sebastian Albrecht, who has compiled and discussed much of the material here employed.

It will be readily understood that in order to secure adequate data for a determination of proper motions of stars belonging to the class here in question I have been compelled to utilize a certain number of catalogues not included in Newcomb's work, and for the reduction of this material to the Newcomb system I have in general employed Auwers' reduction tables, *Astr. Nach. No. 3195–96*, plus the reduction from Auwers to Newcomb. For some of the more recent catalogues I have used the published comparison of the catalogue places with the Newcomb system. The weights assigned to the several catalogues have been taken directly from the Fundamental Catalogue whenever possible. For catalogues not included in Newcomb's list I have assigned weights in accordance with my own judgment, guided by the analogy of Newcomb's weights. See below for a statement of these weights and a control of their adequacy.

When it is desired to determine both the position and the motion of a star, observations made at any epoch are pertinent to the problem and should be included in its discussion, or should be excluded only on the ground of inadequate precision. For the present purpose, however, the motion of the star alone is required, its accurate position at any assigned epoch being of little consequence, and corresponding to this modified requirement ancient and recent observations are of special value, while those of intermediate date can contribute little to a determination of the star's motion. I have therefore ignored much valuable material clustering about the epoch 1870, employing here only a few catalogues to serve as a control upon the linear character of the motions. In addition to the earlier and later catalogues employed by Newcomb I have made chief use of the following authorities:

Pi.	Piazzi. Positiones Mediæ ineunte Saeculo XIX.
Gr.	New Reduction of Groombridge's Circumpolar Catalogue. Dyson, Thackery.
P. M.	Struve. Stellarum Fixarum * * Positiones Mediæ pro Epocha 1830.0.
Tay. D.	Taylor's General Catalogue of Stars for the Equinox 1835.0. Downing.
Pa.	Catalogue de l'Observatoire de Paris.
A. G.	The several zone catalogues of the Astronomische Gesellschaft.
Ci.	Publications of the Cincinnati Observatory, Vols. 13, 14, 15. Porter.
Flint.	Publications of the Washburn Observatory, Vol. XII, Part 2.

In much smaller measure than the above a considerable number of other catalogues have been employed to supplement defective data.

By comparison with Newcomb the weights provisionally assigned to the catalogues above named are as follows:

Pi. Gr. Tay. D.	The same as Bradley.
P. M.	The same as Abo.
Pa. '45	The same as Pond.
Pa. '60	The same as Gh 50.
Pa. '75	The same as Gh 60.
A. G.	The same as Pond.
Ci.	The same as Oxford = R. C. 90.
Flint	The same as Madison.

As a control upon these weights I have found separately for the several catalogues principally employed, and for all stars that I have discussed, the mean of the weighted squares of the residuals in each coordinate, $\frac{1}{n}[pvv]$, and from a comparison of these quantities *inter se* I have obtained factors by which the assumed weights should be multiplied in order to reduce the data to a uniform standard of precision. The better determined of these factors, together with the number of residuals, n, upon which they are based, are shown in the following table, p. 15.

If the weights actually employed in the discussion of the data be multiplied by the factors given on p. 15, we shall obtain a system of weights representing the relative precision of the material contributed to the present discussion by the several catalogues. Such a system of weights, corresponding to a single observation, is contained in the column headed p in the above table. These numbers differ in principle from the Newcomb system of weights in that they are based solely upon the accidental errors of the catalogue places after the systematic corrections have been applied; while the weights employed in the construction of the Fundamental Catalogue have reference to systematic as well as accidental error in the catalogue places as published. While the amount of data entering into these factors and the resulting weights is, of course, much too small to permit these quantities to be regarded as definitive values, they may serve as a partial justification of the weights provisionally adopted. The very large weight found for Flint's observations in right ascension is probably in part fictitious, but it may arise in part from an increased accuracy due to the use of a transit micrometer, and screens to equalize the apparent brightness of all stars observed. From a discussion of the entire data, about 700 residuals, it appears that the probable error corresponding to a position of unit weight upon the scale actually employed, is

$$R.\,A.,\quad r_1 = \pm\, 0.^{s}061. \qquad Dec.,\quad r_1 = \pm\, 0.''54$$

The value of r_1 in right ascension has been obtained without reduction to the equator and therefore corresponds roughly to the mean declination of the stars. When reduced to the equator, by multiplying by $\cos\delta$, we find $r_1 = \pm\, 0.^{s}053$. The numbers thus derived should agree with the corresponding quantities found by

RESULTING CATALOGUE WEIGHTS.

Catalogue	R. A.			Dec.		
	n	Factor	p	n	Factor	p
Br.	56	0.9	0.2	51	1.2	0.1
Pi.	17	0.4	0.2	24	1.0	0.1
C. Ab.	37	1.5	0.8	36	0.9	0.5
P. M.	69	1.2	0.7	68	1.0	0.5
Tay. D.	15	1.4	0.3	15	1.8	0.2
Armagh.	17	0.7	0.3	20	0.5	0.2
Pu. M. '55	59	0.7	0.7	59	0.8	0.8
Pa. '45	19	1.1	0.6	17	0.6	0.3
Gh. '60. Gh. '64	29	1.0	0.8	28	1.1	0.6
Glasgow	16	0.5	0.4	15	0.7	0.3
Pa. '60	19	1.0	0.5	19	0.8	0.4
Pa. '75	13	1.3	1.0	12	1.1	0.6
Rbg.	66	0.9	0.9	64	1.0	1.0
Wash. '75	17	1.1	1.1	17	0.6	0.2
A. G.	41	1.8	0.8	41	1.2	0.4
Gh. '80; Gh. '90	70	1.0	1.0	64	2.0	1.0
Ci.	60	1.5	0.8	58	1.6	0.5
Flint	65	2.5	2.5	64	1.7	0.9

Newcomb, $\pm\ 0.^s060$ and $\pm\ 0.''53$, Fund. Cat., p. 246, and the numerical discrepancy between them is, in fact, insignificant, but Newcomb defines his quantities as *mean* errors, while those here found are probable errors and represent, therefore, a much smaller measure of precision. I am unable to explain this discordance if the quantities given by Newcomb are indeed mean errors, as stated.

The quantities above found may be employed to pass from the weights given by the least square solutions to the corresponding probable errors of the resulting coordinates and proper motions, through the following table:

TABLE B.

WEIGHTS AND PROBABLE ERRORS FOR THE COMPARISON STARS.

p	*R. A.*	Dec.
	s	″
0.1	± 0.192	± 1.71
0.2	.137	1.21
0.3	.111	0.98
0.4	.096	.85
0.5	0.086	0.76
0.6	.079	.70
0.7	.073	.65
0.8	.068	.60
0.9	.064	.57
1.0	0.061	0.54
1.2	.056	.50
1.4	.052	.46
1.6	.048	43
1.8	.045	.40
2.0	0.043	0.38
2.5	.039	.34
3.0	.035	.31
3.5	.032	.28
4.0	0.031	0.27
5.0	.029	.26
10.0	.020	.17
20.0	.013	.12
40.0	± 0.010	± 0.09

The weights that constitute the argument of this table are given in Table IV, which shows for each star the material employed and the residual, O — C., furnished by each catalogue. The mean epochs and weights furnished by the least square solutions are given in italics, the mean epoch of the right ascension being printed in the epoch column immediately above the mean epoch for the declinations. The weights of the coordinates corresponding to these respective epochs are given in the columns p and the weights of the centennial proper motions in the O — C columns.

The definitive results of the investigation are contained in Table III, in which the first column gives a serial number by which the star is represented in Table IV, and the remaining columns are sufficiently explained by their headings. The precessions and secular variations are computed with Newcomb's constants, for the epoch 1850.0, and the century is the unit of time adopted for these quantities as well as for the proper motions, μ, μ'. In the discussion of the observations the computations have been carried one place of decimals further than is here printed, and terms depending on the third power of the time have been taken into account for the Bradley stars; they are inappreciable for all other catalogues employed. The magnitudes printed in this table are taken from the Potsdam Photometrische Durchmusterung, The Harvard Meridian Photometry and the estimates of the Struves in the above order of preference. In a few exceptional cases magnitudes, indicated by a ( ), are the mean of the Bonner Durchmusterung and my own estimates.

Notes relating to peculiarities presented by individual stars will be found in Table VI.

PROPER MOTIONS OF FAINT STARS.

In Table V will be found the combination of the absolute motions of the comparison stars with the relative motions micrometrically determined, and the resultant motion of the faint star. The several columns of the table seem sufficiently described by their headings save that in the last column the letters N, C, denote respectively that the adopted proper motions of the comparison star are taken from Newcomb or have been derived by the author, as set forth in a preceding section. Quite exceptionally the symbol Au. is here employed to denote a proper motion taken from Auwers. The magnitudes given in the third column of the table depend upon the estimates of the double star observers, and are to be regarded as provisional values. At my request Professor E. C. Pickering has kindly undertaken a photometric determination of these magnitudes, and the results of this investigation will be published in the Annals of the Harvard College Observatory.

Whether the motion of a faint star furnished by the combination of data above outlined is a proper motion, in the accepted sense of that term, or is the result of orbital motion in a binary system is in some cases a matter of doubt. Elements tending more or less strongly to mark a proper motion are: (1), a large absolute motion of the comparison star, coupled with a numerically equal relative motion of the opposite sign; (2), a considerable angular distance separating the stars. Elements tending to establish orbital motion are. (3), a large proper motion of the comparison star and small relative motion of the companion; (4), curvature shown in their relative motion; (5), close angular proximity of the stars. From a consideration of these several elements I have to the best of my ability classified the stars in question under three categories, viz:

(a) Not a physical system. Real proper motion.

(b) Uncertain.

(c) A physical system. Orbital motion.

Under the heading Faint Star, A′, D′, these several categories are represented as follows: (a), By a printed number representing the concluded proper motion. (b), By the symbol ?. (c), By the symbol ——. Stars of the second class, (b), have been omitted from all subsequent discussions of the data.

RESULTS.

A detailed discussion of the conclusions to be drawn from the proper motions of Table V cannot here be undertaken, but some application of them will be made and a few matters of immediate inference touched upon.

To obtain some idea of the precision with which, upon the average, the total proper motions, μ, of the stars included in Table V have been derived, we let A″, D″, represent respectively the adopted components of the proper motions of the comparison star, expressed in arc of a great circle, and employing A′, D′, as above to represent the relative motion of the star under investigation, we have

$$\mu^2 = (A' + A'')^2 + (D' + D'')^2 \tag{12}$$

Through the application of familiar principles of the method of least squares we obtain for the probable error of μ

$$^2{}_r = \left(\frac{A' + A''}{\mu}\right)^2 \overline{(A'_r}^2 + \overline{A''_r)}^2 + \left(\frac{D' + D''}{\mu}\right)^2 \overline{(D'_r}^2 + \overline{D''_r)}^2 \tag{13}$$

where the subscript r is employed to denote the probable error of the quantity to which it is affixed. For statistical purposes we may assume with sufficient accuracy,

$$A'_r = D'_r \qquad A''_r = D''_r \qquad (A' + A'')^2 = (D' + D')^2 = \mu^2/2 \tag{14}$$

and obtain thus the more convenient form

$$\mu^2{}_r = \overline{A'_r}^2 + \overline{A''_r}^2 = \overline{D'_r}^2 + \overline{D''_r}^2$$

Introducing here the relations between probable errors and weights above derived, we find

$$\mu^2{}_r = \frac{\overline{0.14}^2}{p_1} + \frac{\overline{0.65}^2}{p_2} = 0.10 + 0.33 \tag{15}$$

where the weights p_1, p_2 relate respectively to the determination of the relative motion and the motion of the comparison star. I find as mean values of these quantities, $p_1 = 0.2$, $p_2 = 1.3$ which furnish the numerical values above given for $\mu^2{}_r$ and the mean result,

$$\mu_r = \pm\, 0.''65,$$

which represents the average probable error of the total centennial motion of one of the faint stars under discussion. The average probable error of an A′ or D′ is, of course, to be found by dividing μ_r by $\sqrt{2}$, i. e., ± 0.″46. It is evident from what precedes that this measure of uncertainty is mainly due to the adopted proper mo-

tions of the comparison stars, and that any improvement in the character of the result must be sought at this point. No increase in the number of micrometric observations or in the time interval covered by them will count for as much as even a small gain in the precision of the proper motions of the comparison stars. On the other hand the time interval covered by the micrometric observations may be reduced to about thirty years before the component probable error arising from this source equals that arising from the adopted motions of the comparison stars. It should be explicitly stated that the value of p_2, above employed, relates only to those stars whose motions have been determined by myself. The proper motions taken from Newcomb are presumably better determined, at least for the brighter stars, and the value of μ_r for these stars is correspondingly less.

With respect to the average measure of precision thus obtained we note that if the adopted values of μ are in the main, or in great part, fictitious, we should expect to find about one half of them less than 0.″65 in amount, or more than one half of them should fall below this limit if account is taken of the presumed superior accuracy of the Newcomb proper motions. In fact, of the 178 values of μ here determined only nine fall below the average probable error, 0.″65, and I regard this fact as tending strongly to establish the real character of these proper motions. A confirmation of this view may be found in the average amount of the proper motions considered as a function of stellar magnitude. If the motions are real the fainter stars, being presumably more remote, should on the whole present smaller proper motions than do the bright ones, while no such relation should be found if the observed values of μ are in great part the result of accumulated errors. In the following table the results are classified with respect to the estimated magnitude of the stars, and the progressive diminution of the total proper motion with diminishing brightness is clearly shown, both by the mean value and the median value in each class. The small number of stars entering into the first class, 6–8 magnitude, is probably responsible for the exaggerated values here found.

TABLE C.

RELATION OF PROPER MOTION TO MAGNITUDE.

Limiting Magnitudes.	**	Centennial μ	
		Mean.	Median.
		″	″
6.0– 7.9	13	15.3	8.0
8.0– 8.9	29	7.6	3.0
9.0– 9.9	49	3.7	2.0
10.0–10.9	50	3.2	2.5
11.0–13.0	36	2.5	2.1

I conclude that the proper motions here determined are genuine and, relating to stars fainter than any hitherto investigated for proper motion, they substantially extend the material available for an interpretation of the stellar system. We note the following immediate inferences from them:

The stars here investigated have been selected from the great body of faint stars by no criterion that impairs their representative character. In so far as their number is sufficient to furnish a reliable mean result that result may be attributed to stars of like magnitude, not here included.

The average stellar magnitude of these stars is not far from 9.5, and their average proper motion, 3″ or 4″ per century, is considerably greater than has been commonly assumed for that magnitude, i. e., the average faint star is nearer than has been supposed.

A clearly marked correlation between the proper motions and any other intrinsic property of the stars must be regarded as of special significance, and from this point of view the following classification of the proper motions with respect to proximity to the milky way is of interest. Dividing the total surface of the sky into four equal zones by means of the galaxy and two small circles parallel thereto and distant 30° from it, I have found, μ_1, the mean value of the total proper motion of all stars contained in each zone, including those comparison stars fainter than 7.5*m*, whose proper motions have been directly determined from meridian observations. The results are as follows:

Limits of Gal. Latitude.	No. of Stars.	μ_1.
		″
+ 90°, + 30°	62	7.3
+ 30 , 0	47	4.0
0 , − 30	46	2.8
− 30 , − 90°	28	8.2

The marked difference in the average proper motion of galactic and extra-galactic stars here shown is of such fundamental importance for an interpretation of the stellar system that I have sought to examine somewhat more closely its nature; whether it is to be regarded as due to the presence of a great annulus of distant galactic bodies, superposed upon an assemblage of nearer and more uniformly distributed ones, which alone constitute the extra-galactic stars, (the conventional view of the galaxy,) or whether the change in μ is of a progressive character incompatible with such a conception of the stellar system. For this purpose I have grouped the proper motions in narrower zones of galactic latitude, and to avoid the prejudicial effects of a small number of abnormally great proper motions, I have rejected from each zone every proper motion greater than four times the average proper motion of the zone, making repeated applications of this criterion until no more stars were rejected by it. The results of this classification are shown in the following table in which the first column defines the limits of each zone, the second

and third columns n_1, n_2, show respectively the number of stars rejected by the above criterion and the number retained, the fourth column, μ_2, shows the mean of the proper motions retained, the fifth column, μ_3, contains the median value of μ for the zone, or rather the mean of the median and the two or three values adjacent to it on either side, the sixth column, m, gives the mean magnitude of the stars, and the last column, μ_4, contains a corrected value of μ_2, explained below.

TABLE D.

RELATION OF PROPER MOTIONS TO THE GALAXY.

Galactic Latitude.		n_1	n_2	μ_2	μ_3	m	μ_4
				"	"		
+ 90°	+ 60°	0	22	4.6	3.3	9.8	4.8
60	40	3	18	4.1	3.5	9.3	4.0
40	30	2	17	4.5	3.2	9.8	4.7
30	20	1	13	2.7	1.6	9.6	2.7
20	10	0	13	1.8	1.9	10.0	1.9
+ 10	0	2	16	2.8	2.1	9.6	2.8
0	− 10	1	15	2.5	1.6	9.3	2.4
− 10	− 20	0	13	2.2	1.7	10.0	2.4
− 20	− 30	0	17	2.7	2.1	9.7	2.8
− 30	− 50	2	17	3.3	2.3	9.7	3.4
− 50	− 90	1	8	4.7	3.1	9.2	4.5

It is here clearly shown that the average proper motion has a minimum value in the galaxy and is approximately symmetrical in amount on either side of it,* but the data is hardly sufficient to determine the law of its variation. In order, however, to extract from the material such information as it can be made to furnish, I have employed the mean magnitudes, m, in connection with the data furnished by Table C to reduce the observed μ_2 to a value corresponding to the magnitude 9.5. This result is shown under the heading μ_4, and from a graphical adjustment of the values thus derived, and an assumed symmetry with respect to the galaxy, I obtain the following mean values of the proper motion considered as a function of galactic latitude.

*Compare the above with a similar conclusion as to the mean parallax of the Groombridge stars derived by Eddington. Monthly Notices, R. A. S., Dec., 1907.

TABLE E.

MEAN CENTENNIAL MOTION, MAGNITUDE 9.5.

Galactic Latitude.	μ
	$''$
0°	2.5
10	2.5
20	2.8
30	3.2
40	3.6
50	4.1
60	4.6
70	5.2
80	5.6
90	5.8

While more abundant data would doubtless modify, to some extent, these proper motions, I regard their general course as well established by Table E. They obviously imply that the milky way is a dominant feature of the stellar system whose influence is not limited to the galactic region alone, but is felt in every part of the visible universe. From an enumeration of the stars of the Bonner Durchmusterung Seeliger has reached a similar conclusion, which he interprets as denoting a finite extent and measurable dimensions of the stellar system. It is perhaps worthy of note that the shape and relative dimensions of the system thus postulated by Seeliger, an ellipsoid whose major axis, in the galaxy, and minor axis, perpendicular to it, are in the ratio of 11 : 5, accord very well with the amount of the mean proper motions shown in Table E. But, that the available data are to be interpreted as indicating a limited visible universe of measureable extent seems to me very questionable. As alternative hypotheses equally available in explanation of the data there may be suggested either of the following:

(a) The mean luminosity of the stars is a diminishing function of their linear distance from the plane of the galaxy.

(b) The interstellar spaces are occupied by a feebly absorbing medium whose optical density increases with increasing distance from the galaxy.

The latter hypothesis stands in such obvious relation to the well known increase in the amount of diffuse meteoric matter in high galactic latitudes that it appears worthy of special investigation, which I have in part already made but whose details must be reserved for presentation elsewhere.

THE PRECESSION CONSTANT AND THE SOLAR MOTION.

The proper motions of a star, A′, D′, may be regarded as arising from two sources, viz., the effect of errors in the assumed precession constants, m, n, and the orbital motion of the star itself. If Δm, Δn represent the corrections to the assumed precession constant that will best represent the totality of observed motions, it is readily seen that these quantities contribute to the proper motion of any star, as derived from observation, terms of the form

$$A'_1 = \Delta m + \Delta n \sin \alpha \tan\delta \qquad D'_1 = \Delta n \cos \alpha \tag{16}$$

Ignoring these terms and treating the observed proper motions, A′, D′, as if due solely to the motions of the stars relative to the sun, I have elsewhere (*Astronomical Journal No. 591*) discussed these motions to determine the flux of the stars, or the motion of the sun relative to them. I have there established the following relations for a group of p stars, in which ρ represents the unknown motions of these stars in the line of sight, r, their distances from the sun, and X'', Y'', Z'' the rectangular coordinates of the solar motion referred to a system of coordinates whose fundamental plane coincides with the equator but in which the position of the axis of x is left indeterminate:

$$\begin{aligned} pX'' &= \sin 1'' \Sigma \sin \alpha' .rA'_2 + \sin 1'' \Sigma \sin \delta \cos \alpha' .rD'_2 - \Sigma \cos \delta \cos \alpha' .\rho \\ pY'' &= -\sin 1'' \Sigma \cos \alpha' .rA'_2 + \sin 1'' \Sigma \sin \delta \sin \alpha' .rD'_2 - \Sigma \cos \delta \sin \alpha' .\rho \\ pZ'' &= \qquad - \sin 1'' \Sigma \cos \delta .rD'_2 \qquad - \Sigma \sin \delta .\rho \end{aligned} \tag{17}$$

The subscript 2 here assigned to the proper motions, A′, D′, denotes that they represent only the orbital motions of the stars and must be supplemented by the terms $'A_1$, D'_1, above given, in order to represent the complete proper motions, i. e., $A' = A'_1 + A'_2$, $D' = D'_1 + D'_2$. Let us assume that the p stars above included in the summation symbol are a group of proper motion stars lying within a lune of the sky bounded by the hour circles whose right ascensions are $\alpha' - 1^h$ and $\alpha' + 1^h$, and let us further assume that the axis of x is directed toward the center of this lune, then, as is shown in the article above cited, we may with sufficient accuracy assume for the entire group of stars, $\sin \alpha' = 0$, $\cos \alpha' = +1$ and write the second equation of the group in the form,

$$\frac{1}{p} \Sigma rA'_2 = - sY'' \tag{18}$$

where $s = \frac{1}{\sin 1''} = 206265$, and Y'' now represents the equatorial component of the solar motion perpendicular to the hour circle α'. The first of Eq. (16) may be written in the form

$$\frac{1}{p}\Sigma rA'_1 = \Delta m \,.\, \frac{1}{p}\Sigma r + \Delta n \,.\, \frac{1}{p} \quad r \sin \quad \tan \delta \tag{19}$$

in which, however, α must be measured from the vernal equinox and not from the middle of the lune. Adding this expression to the preceding equation and intro-

ducing the abbreviations defined below, we obtain as the complete expression for the observed motions,

$$A''_1 = R''_1 \,.\, \Delta m + Rt_1 \,.\, \Delta n - s Y''_1 \tag{20}$$

Abbreviations.

$$A''_1 = \frac{1}{p} \Sigma\, r A'' \qquad R''_1 = \frac{1}{p} \Sigma\, r \qquad Rt_1 = \frac{1}{p}\, r \sin \alpha \tan \delta \tag{21}$$

Values of r, which appear in these expressions, are to be obtained for each star through Kapteyn's empirical formula that represents parallax as a function of proper motion and magnitude. *Publications * * * Groningen No. 8, p. 24*; *Astronomical Journal No. 558.*

For the opposing lune, $\mu' + 12^h$, we have $\sin \alpha = 0$, $\cos \alpha' = -1$ and introducing the subscript 2 as a distinguishing mark

$$A''_2 = R''_2 \,.\, \Delta m + Rt_2 \,.\, \Delta n + s\, Y''_2 \tag{22}$$

and by subtraction

$$A''_1 - A''_2 = (R''_1 - R''_2)\, \Delta m + (Rt_1 - Rt_2)\, \Delta n - s(Y''_1 + Y''_2) \tag{23}$$

Here $Y''_1 + Y''_2 = 2Y''$; is twice the solar motion perpendicular to the median plane of the double lune. The total motion of which Y'' is a component may be expressed by the coordinates, A_0, D_0, V_0, where A_0 and D_0 are respectively the right ascension and declination of the apex of the solar motion relative to the stars in question and V_0 is the velocity of that motion in radii of the earth's orbit per annum. If we put

$$x = 2s\, V_0 \cos D_0 \cos A_0 \qquad y = 2s\, V_0 \cos D_0 \sin A_0 \tag{24}$$

we shall find

$$s\,(Y''_1 + Y''_2) = -x \sin \alpha' + y \cos \alpha' \tag{25}$$

where α' denotes the right ascension of the center of the lune designated by the subscript 1.

If we represent by w the correction required by the assumed general precession (5024.″53, Newcomb) we shall have,

$$\Delta m = w \cos \varepsilon \qquad \Delta n = w \sin \varepsilon$$

where ε is the obliquity of the ecliptic. In terms of these quantities we now write Eq. 23, 25 in the form

$$x \sin \alpha' - y \cos \alpha' + C\, w = A''_1 - A''_2 \tag{26}$$

where the coefficient of w has the value

$$C = (R''_1 - R''_2) \cos \varepsilon + (Rt_1 - Rt_2) \sin \varepsilon \tag{27}$$

Each of the six double lunes into which the sky has been divided will furnish an equation of this form, and if we suppose these equations to be simultaneous, they will more than suffice for the determination of the unknowns, w, x, y. I shall provisionally assume this relation to exist, i. e., that the mean flux of the stars in any double lune does not differ sensibly from the mean flux in any other double lune, and I shall leave the legitimacy of this assumption to be subsequently investigated.

The unknown terms in ρ, the radial velocity, have been eliminated in the preceding analysis by grouping the stars in lunes in each of which the mean value of the coefficient of ρ is zero. A similar elimination may be obtained in the determination of Z'' by confining the summation to zones symmetrically placed with respect to the equator, since $\Sigma \sin\delta$ is thus made zero. Dividing the adopted zones into lunes as above, and following the methods there employed, we introduce the abbreviations,

$$D'' = \frac{1}{p}\Sigma\, r \cos\delta \,.\, D' \qquad R^c = \frac{1}{p}\Sigma\, r\cos\delta\cos\alpha' \tag{28}$$

and obtain the relation

$$(R_1^{\,c} + R_2^{\,c})\sin\varepsilon \,.\, w - 28\, Z'' = D''_1 + D''_2 \tag{29}$$

The coefficient of w is here so small that it seems expedient to determine a correction to the precession from the right ascensions only and introducing the resulting value of w into Eq. 29, determine a value of Z'' from each of the six double lunes. The agreement or disagreement among these values will furnish a partial criterion of the legitimacy of the assumption above made with regard to a uniform flux in the several lunes, and a further but weaker control upon the same assumption may be obtained from the residuals furnished by the equations in right ascension.

Applying Eq. (26) to the several double lunes indicated below by the right ascension, α', we obtain the following system of numerical equations:

α'	Equations	n
h	$''$	
0	$0.00x - 1.00y + 1.47w = +4.33$	34
2	$+0.50x - 0.87y + 1.37w = +0.67$	31
4	$+0.87x - 0.50y + 1.01w = +5.99$	18
6	$+1.00x + 0.00y + 2.18w = +2.84$	28
8	$+0.87x + 0.50y + 1.04w = -2.06$	32
10	$+0.50x + 0.87y - 0.87w = -5.04$	26

The number of stars upon which each equation is based is shown under the rubric n. Giving to these equations equal weight a least square solution furnishes the following elimination equations and the resulting values of the unknowns:

$$\begin{aligned} x - 0.00y + 1.39w &= +1.35'' \qquad & x &= +0.61'' \\ y - 1.13w &= -4.42 \qquad & y &= -3.82 \\ w &= +0.53 \qquad & w &= +0.53 \end{aligned}$$

The unknown w is, however, poorly determined, its weight being slightly less than 2. To improve this determination, if possible, I resort to the following procedure: Adding Eq. (20) and Eq. (22) we find

$$A''_1 + A''_2 = C'w + s(Y''_2 - Y''_1) \quad (30$$

where C' is introduced as an abbreviation for the quantity

$$(R''_1 + R''_2) \cos \varepsilon + (R_1 t + R_2 t) \sin \varepsilon = C' \quad (31$$

I here assume $Y''_2 = Y''_1$, i. e., that the stars in opposing halves of the double lune possess in the mean the same flux perpendicular to the median plane of the lune, and obtain thus the following equations for the determination of w, from the several double lunes indicated by the right ascensions α'.

α'	Equations.			n	w
h			″		″
0	$4.51w$	=	-0.47	34	-0.10
2	$6.45w$	=	-1.17	31	$-.18$
4	$4.90w$	=	-2.63	18	$-.54$
6	$6.85w$	=	$+0.24$	28	$+.04$
9	$5.29w$	=	-4.65	32	$-.88$
10	$4.42w$	=	$+0.18$	26	$+.04$

The number of stars entering into each equation is shown under the rubric n and the resulting values of w are given in the last column of the exhibit. The discordance among these values appears to me greater than can be attributed to the uncertainty of their determination, indicating, therefore, an error in the fundamental assumption of no relative flux. Despite this, at least partial, failure of the theoretical basis of the method I adopt as the best result attainable from the data $w = -0.''29$, obtained from the least square solution in which equal weight is given to each of the foregoing equations. Applying this as a correction to Newcomb's values I find for the epoch 1850 the following precession constants which, upon the whole, best satisfy the present data

$$\text{General Precession} = 5023.''68 \qquad m = 4606.''84 \qquad n = 2005.''00$$

Introducing the value of w into the equations for the determination of x and y I find

$$x = +1.''46 \qquad y = -4.''75$$

From the declinations we obtain the following equations for the determination of the third coordinate of the solar motion, $Z = -2sZ''$

α'	Equations.	n	z
	$''$		$''$
0	$z + 0.49w = -5.25$	34	-5.11
2	$z + 0.10w = -6.45$	31	-6.42
4	$z + 0.08w = -6.16$	18	-6.14
6	$z + 0.08w = -3.82$	28	-3.80
8	$z + 0.14w = -7.41$	32	-7.37
10	$z + 0.37w = -4.74$	26	-4.63

The values of z, given in the last column, are obtained by putting $w = -0.''29$ as found above, but it appears that the value of z is nearly independent of the adopted precession constant. The simple mean of the values of z above found is $-5.''58$, and the weighted mean, when each result is assigned a weight proportional to the number of stars upon which it is based, is $-5.''54$.

The above determination of z includes all of the available data, and the radial velocities are not eliminated from the result. To secure this elimination we may confine the summation to a zone extending 30° on either side of the equator and find the following results for the several double lunes corresponding to the right ascensions α', when $w = -0.''29$.

α'	n	z
		$''$
0	16	-6.14
2	25	8.80
4	15	5.45
6	13	2.56
8	12	8.87
10	16	-4.06

The simple mean of these quantities is $z = -5.''98$. I adopt as a definitive result the mean of this quantity and that above found from all the stars, viz., $z = -5.''78$.

Replacing x, y, z, by the corresponding polar coordinates A_0, D_0, V_0, we obtain the following coordinates of the solar motion corresponding to Newcomb's value of the general precession, N, and to the correction to that precession above found, C.

Precession.	N.	C.
	$''$	$''$
w	0.00	-0.29
A_0	287°	290°
D_0	52°	49°
Annual Motion	3.72	3.85

According to Campbell, Astrophysical Journal, Vol. XIII, p. 83, the amount of the solar motion referred to a certain group of bright stars is 4.2 radii of the earth's orbit per annum. If we assume this group of stars to have upon the whole no motion with respect to the stars that I have employed, the small discrepancy between Campbell's value and the annual motion above found, would imply that the values of the stellar parallaxes given by Kapteyn's formula are about 10 per cent too large for stars of the magnitude here considered. It seems safer, however, to regard the approximate agreement of velocities here found as evidence that the mean relative flux of near and distant stars is small, and to leave to the future the exact interpretation of the minute discordances here found.

The coordinates of the solar motion above found depend, in form at least, upon the assumptions made with regard to the distances of the stars, and I have sought to control these values by the application to my data of a method due to Bessel, which is independent of all scalar relations and involves only the apparent directions of the proper motions. Since each proper motion of necessity follows some great circle of the celestial sphere, we may completely define the direction of this motion by the coordinates of that pole of the given circle about which the star's motion appears to take place in the counter-clockwise direction. The position of this pole depends upon the coordinates of the star as well as upon its proper motion, but if the stars composing any group, however placed, possess a common motion, i. e., in parallel right lines, the poles of their respective proper motions will all lie upon the great circle whose plane is perpendicular to the common direction of motion. Any tendency to a common drift among the stars may therefore be recognized by the tendency of their poles to cluster about a determinate great circle whose position in the sky fixes the direction of motion. For each of the foregoing proper motions I have computed the position of its pole referred to a system of coordinates whose z axis points to the apex of the solar motion and whose x axis lies in the plane determined by the great circle drawn from the point thus defined to the south pole of the heavens. Since the direction of the z axis coincides with the supposed flux of the stars relative to the sun, the poles of their proper motions should show a distinct tendency to cluster about the fundamental plane of this system, and the extent of this tendency will furnish a rough measure of the relative influence of systematic and sporadic motion in determining the actual proper motions.

The results of this computation are plotted in Plate I, whose vertical scale has been so chosen as to maintain an equal surface representation of the sky. Poles of stars brighter than the ninth magnitude are represented by a triangle, poles of stars fainter than the eleventh magnitude by a circle, intermediate magnitudes by a *. From this plate I obtain the following observed distribution of poles, O, which is compared below with the uniform distribution, C, that might be expected if there were no tendency to a common drift among the stars.

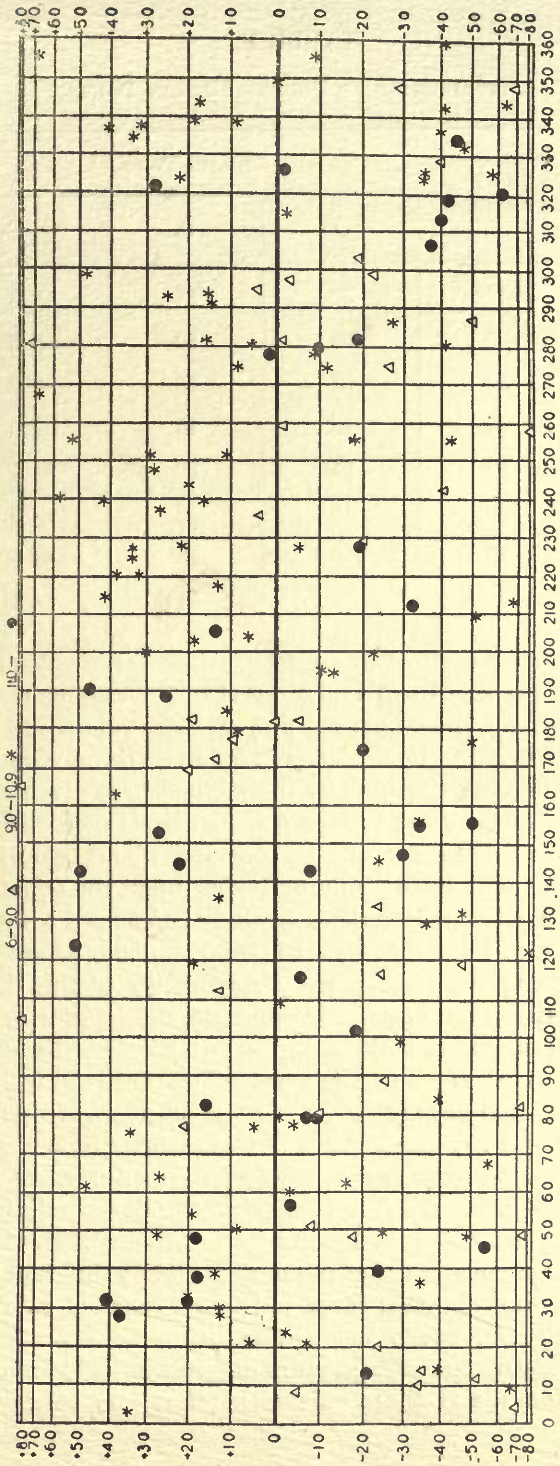

Plate I.—Poles of the Proper Motions.

TABLE F.

DISTRIBUTION OF PROPER MOTION POLES.

Limits of Sunway Latitude.	No. of Poles.		
	O.	C.	O.-C.
± 0°-10°	37	31	+ 6
± 10 -20	38	30	+ 8
± 20 -30	31	28	+ 3
± 30 -40	25	25	0
± 40 -50	21	22	− 1
± 50 -60	10	18	− 8
± 60 -70	8	13	− 5
± 70 -90	7	11	− 4

There is here manifest a distinct tendency to an excess of poles in the region adjacent to the equator of the sun's way and a defect in the regions remote from it, such as should be furnished by the supposed flux of stars relative to the sun, but it is also apparent that this clustering tendency is far from being a dominant one.

In theory it is possible to determine by the method here given a tendency among the stars to form two independent groups each with its own direction of common motion.* The poles in this case would be clustered about two great circles which, when plotted in Plate I, will have common nodes upon the equator of that figure. About these nodes the poles will be more strongly condensed toward the axis of the figure (equator) than will be the case 90° from a node, where the great circles diverge most widely one from another. No tendency of this kind is shown in Plate I, where the distribution of poles is approximately uniform, but it is doubtful if the data there represented are sufficient in amount to reveal such a tendency.

It is, perhaps, worthy of note that the stars whose poles fall in high latitudes are on the average about a magnitude brighter than those whose poles lie nearer the equator of the figure, and that among the 37 stars fainter than the eleventh magnitude. here shown, there is only one whose pole falls in a latitude greater than 60°. There should be four or five such if the poles were uniformly distributed.

We may summarize as follows the results above attained: The faint stars furnish a value of the precession constant that is not appreciably different from that yielded by the brighter ones, showing that there exists no sensible rotation of the nearer stars, as a whole, with reference to those more distant.

The solar motion relative to the faint stars differs but little from its motion relative to the brighter ones, and there exists, therefore, no considerable systematic

* Kapteyn, Eddington.

motion of translation of the nearer, relative to the remoter parts of the stellar system.

The data furnished by the present investigation is inadequate to show the star streaming effect determined by Kapteyn and Eddington.

THE MASSES OF BINARY STARS.

Among the stars represented in Table V there are a certain number recognized as members of binary systems with very slow angular motions. For each such star I have derived from the least square solution the value of the double areal velocity in the apparent orbit,

$$s^2 \frac{dp}{dt} = D A' - A D',.$$

which is the only element of the orbit that can be determined from existing data, and I have sought to utilize it as follows:

If s is the apparent and r the true radius vector in a binary system, we have

$$s = r \cos \beta$$

Where β is the star's latitude reckoned from a plane tangent to the celestial sphere. But

$$\sin \beta = \sin i \sin u$$

where i is the inclination of the orbit plane to the tangent plane above defined, and u is the argument of the latitude. Therefore, in the customary notation of celestial mechanics,

$$s = r \sqrt{1 - \sin^2 i \sin^2 u}$$

$$= \frac{a(1-e^2)}{1+e \cos v} \sqrt{1 - \sin^2 i \sin^2 u}$$

from which we obtain,

$$a = \frac{s(1+e \cos v)}{(1-e^2)\sqrt{1 - \sin^2 i \sin^2 u}}$$

To determine the average relation between a and s, I adopt the following mean values of the elements involved:

$e = 0.5$	$1 + e \cos v = 0.95$
$\sin^2 i = \frac{2}{3}$	Mean value over a hemisphere
$\sin^2 u = \frac{1}{2}$	Mean value over a circumference

and find thus, as a mean relation, $a = 1.55\, s$.

As a control upon this number I have derived the value of the ratio $\frac{a}{s}$ for the epoch 1890.0 for each orbit contained in See's Researches upon the Evolution of the Stellar System, I, and find

From the first thirteen orbits,	1.5
From the following fourteen orbits,	1.3
From the last thirteen orbits,,	1.8

In view of these numbers we shall not go far astray in assuming as an average relation $a = 1.5\,s$.

The area of an apparent orbit is

$$A = \pi\, a^2\, (1 - e^2)^{\frac{1}{2}} \cos i$$

and introducing here mean values as follows:

$$a = 1.5\,s \qquad e = 0.5 \qquad \cos i = \tfrac{1}{2}$$

we find

$$A = [0.485]\, s^2$$

The periodic time in the system is

$$T = \frac{2A}{s^2 \frac{dp}{dt}} = 6.12 \Big/ \frac{dp}{dt}$$

where $\frac{dp}{dt}$ must be expressed in parts of the radius. When this coefficient is to be expressed in degrees per annum, we must multiply by 57.3, and find thus

$$T = 350^\circ \Big/ \frac{dp}{dt}$$

i. e., the mean periodic time is somewhat less than would be indicated by the angular velocity.

When the year and the sun's mass are adopted as units we have for the mass of any binary star $M + m = a^3 \,/\, T^2$. The major axis a must here be expressed in terms of the radius of the earth's orbit, i. e., its angular value must be divided by the star's parallax, π, which is to be obtained from Kapteyn's formula. We have thus

$$M + m = \frac{[8.956]}{s\pi^3} \left(s^2 \frac{dp}{dt}\right)^2$$

By means of the last expression I have computed the mass of each obviously binary system included in Table V, and the results of this computation are shown in the following exhibit, where the first column gives the serial number by which the star is designated in Table V.

TABLE G.

MASSES OF BINARY STARS.

Star.	$M + m$	Star.	$M + m$
7	0.4	125	0.1
27	1.7	126	2.5
35	27.	133	2.0
38	1.2	134	0.002
41	0.0001	135	8.
52	3.6	141	17.
53	490.	151	140.
64	49.	172	14.
74	1200.	176	500.
75	1100.	194	0.0001
91	28.	199	1.8
95	1.8	212	33000.
103	1.1	219	2.0
111	2.3		

The mean of the values of $M + m$, here found, has little significance, since it is determined chiefly by one or two abnormally large values. A better measure of the average mass of the stars is found in the median value of $M + m$, and I obtain thus (mean of the median and the adjacent value on each side) 3.9. I have also found the geometric mean of each pair of values equidistant from the median, when the results are arranged in the order of magnitude, and obtain a set of fairly accordant numbers, ranging from 1 to 12, whose arithmetical mean is 5.5, whose geometric mean is 4.0, and median 5.5. I conclude that the average binary system here represented has a mass some 4 or 5 times as great as that of the sun.

I have applied a similar process to the binary systems, whose elements are given in See's Evolution of the Stellar System, I, omitting three systems in which the elements and proper motion appear too ill-determined for this purpose, using Kapteyn's hypothetical parallaxes and the major axes as given by See. I find thus for the thirty-seven available stars a series of values of $M + m$, ranging from 0.17 to 510. When these values are arranged in the order of their magnitude and the geometric mean of numbers equidistant from the median is taken, I find for the mean mass, $M + m$, a set of numbers ranging from 9 to 18 and having 12 as its mean value, while the median of the entire series is 10.

The marked difference between these numbers and those above found for the slow moving stars of my list ($M + m = 4$ or 5) may be regarded as indicating a real difference of average mass, or as arising from an erroneous assumption with regard to the ratio of the observed angular distance between the stars to the semi-axis major of their orbits. The two sets of numbers may be brought into agreement by increasing this ratio from 1.5 to 2.1, but the latter number differs so greatly from that indicated alike by theory and by experience that I am loath to adopt it.

Upon the whole I regard the results as indicating that the slow moving binary systems have masses of the same order of magnitude as the more rapid ones, but of somewhat smaller amount, e. g., one-half, as would be expected *a priori*, since small mass is an element tending toward slow angular motion. The mass of the sun appears to be considerably less than that of the average binary star.

SUMMARY.

We may briefly recapitulate the results above reached, as follows:

1. The proper motions of stars between the eighth and twelfth magnitudes are sensible quantities, amounting on the average to 4″ per century.

2. These motions are systematically and progressively greater outside the galaxy than in it.

3. The precession and solar motion furnished by these faint stars differ by little more than their own probable errors from those obtained from the brighter stars, fourth to eighth magnitude.

4. The linear velocity of the sun relative to the faint stars, considered as a group, is approximately the same as its linear velocity spectroscopically determined from the brighter stars. This conclusion depends upon the average reliability of Kapteyn's hypothetical parallaxes.

5. The result summarized under 3 and 4 lead to the conclusion that the motion of the nearer stars referred to those more distant is small, or possibly insensible, a result not conformable to Gill's supposition of a relative rotation of these stars.

6. Binary stars of slow relative motion, i. e., those in which the period is measured by thousand's of years, have masses somewhat less than the more rapidly moving ones, but of the same order of magnitude. The slowness of their revolution is due chiefly to the great size of the orbits in which they move.

7. The mass of the sun is considerably less than that of the average binary star.

TABLE I.

Observations of Double Stars.

Arg. 559.

R. A., $0^h\ 1^m.4$ Dec., 28° 28′

Date.	Sid. T.	p	s	Ocular.	Remarks.
	h	° ′	″		
1903.726	22.9	249 58	157.10	V	
.729	22.2	249 53	157.02	V	
.770	22.9	250 1	157.14	V	
1903.742	3 *n*	249 57.3	157.09		

α Andromedae.

R. A., $0^h\ 3^m.2$ Dec., 28° 33′

1902.121	5.9	274 54	73.99	X	Difficult observation,
.129	5.1	274 40	73.66	X	Telescope shaking.
.141	5.4	274 47	74.04	X	

Σ 23.

R. A., $0^h\ 12^m.4$ Dec., — 0° 14′

1903.770	23.3	336.4	5.51	V	
.773	23.6	335.7	5.37	V	
.776	23.5	335.9	5.55	V	
1903.773	3 *n*	336.00	5.48		

6.

R. A., $0^h\ 14^m.8$ Dec., 37° 41′

1903.732	21.5	18 55	69.13	V	
.773	22.1	18 45	69.66	V	
.776	21.7	18 45	69.51	V	
1903.760	3 *n*	18 48.3	69.43		

Σ 27. 42 Piscium.

R. A., $0^h\ 17^m.2$ Dec., 12° 57′

Date.	Sid. T.	p	s	Ocular.	Remarks.
	h	° ′	″		
1903.082	4.7	331 53	28.91	X	
.089	4.3	332 13	29 16	X	
.108	4.3	331 34	28.75	X	
1903.093	3 *n*	331 53	28.94		

49 Piscium.

R. A., $0^h\ 25^m.6$ Dec., 15° 29′

1903.740	22.2	103 27	19.15	X	
.770	23.5	103 0	19.39	V	
.773	23.8	103 16	19.52	V	
1903.761	3 *n*	103 14.3	19.35		

42. A. B.

R. A., $0^h\ 30^m.7$ Dec., 29° 27′

1903.740	22.6	27.6	5.69	V	
.773	22.5	26.6	5.64	V	
.776	23.2	28.0	5.68	V	
1903.763	3 *n*	27.73	5.67		

42. A. C.

R. A., $0^h\ 30^m.7$ Dec., 29° 27′

1903.740	22.5	202 32	35.43	V	
.773	22.3	202 2	35.43	V	
.776	23.1	202 29	35.22	V	
1903.763	3 *n*	202 21	35.36		

54 Piscium.

R. A., 0^h $34^m.2$ Dec., 20° 43′

Date.	Sid. T.	p	s	Ocular.	Remarks.
	h	° ′	″		
1903.740	22.9	92 47	120.36	V	6 — 10.5 *m.*
.770	23.8	92 38	120.44	V	6 — 10.5
.773	23.3	92 31	120.74	V	6 — 11
1903.761	3 *n*	92 38.7	120.51		

α Cassiopeiae.

R. A., 0^h $34^m.8$ Dec., 55° 59′

1903.082	6.1	280 15	64.51	X	
.097	4.9	280 26	63.96	X	
.100	5.7	280 13	63.80	V	
1903.093	3 *n*	280 18.0	64.09		

μ Andromedae.

R. A., 0^h $51^m.2$ Dec., 37° 57′

1903.732	22.0	41 1	272.64	V	
.773	21.7	41 6	272.64	V	
.776	22.0	40 56	272.89	V	
1903.760	3 *n*	41 1.0	272.72		

Σ 80.

R. A., 0^h $54^m.3$ Dec., +0° 15′

1903.740	23.3	319 16	21.65	V	
.773	0.1	319 23	21.42	V	
.776	23.7	319 23	21.51	V	
1903.763	3 *n*	319 21	21.53		

σ Piscium.

R. A., $1^h\ 0^m.8$ Dec., 31° 39′

Date.	Sid. T.	p		s	Ocular.	Remarks.
	h	°	′	″		
1903.089	4.6	294	0	55.75	X	Very difficult. Haze.
.097	5.4	293	36	56.32	X	
.100	5.4	293	22	56.33	V	
1903.095	3 *n*	293	39	56.13		

μ Cassiopeiae.

R. A., $1^h\ 1^m.6$ Dec., 54° 26′

Date.	Sid. T.	p		s	Ocular.	Remarks.
1902.058	4.0	211	33	183.86	X	
.064	4.5	211	30	183.74	X	Good.
.116	6.0	211	35	183.89	X	Good.
1902.079	3 *n*	211	32.7	183.83		

80 Piscium.

R. A., $1^h\ 3^m.2$ Dec., 5° 7′

Date.	Sid. T.	p		s	Ocular.	Remarks.
1903.740	23.8	129	6	159.60	V	
.773	0.4	128	57	159.14	V	
.797	22.9	129	5	160.04	V	Very bad seeing.
1903.770	3 *n*	129	2.7	159.59		

Cassiopeiae.

R. A., $1^h\ 5^m.0$ Dec., 54° 37′

Date.	Sid. T.	p		s	Ocular.	Remarks.
1903.773	22.7	134	33	145.89	V	
.776	22.3	134	22	146.02	V	
.797	22.3	134	32	146.32	V	
1903.782	3 *n*	134	29.0	146.08		

ψ Cassiopeiae; A, ½ (B + C).

R. A., 1^h $18^m.5$ Dec., 67° 38′

Date.	Sid. T.	p	s	Ocular.	Remarks.
	h	° ′	″		
1903.732	22.3	110 39	26.85	V	Very bad seeing.
.773	22.9	108 32	26.71	V	(A. B.)
.776	22.7	108 26	27.21	V	(A. B.)
.797	22.5	108 44	26.47	V	
1903.770	4 *n*	109 5	26.81		

ψ Cassiopeiae. B. C.

R. A., 1^h $18^m.5$ Dec., 67° 38′

1903.773	23.1	251.8	2.99	V	11 — 11.5 *m.*
.776	22.9	253.2	2.64	V	10.5 — 11
1903.774	2 *n*	252.50	2.82		

125.

R. A., 1^h $21^m.9$ Dec., — 0° 40′

1903.773	0.8	342 46	40.54	V	
.814	1.2	343 11	40.56	X	
.817	0.3	343 2	40.63	X	
1903.701	3 *n*	343 0	40.58		

μ Piscium.

R. A., 1^h $24^m.9$ Dec., 5° 38′

1903.773	1.1	301 36	181.11	V	4 — 11.5 *m.*
.814	1.4	301 47	181.28	X	4 — 11
.817	0.1	301 45	181.04	X	5 — 11
1903.701	3 *n*	301 43	181.14		

Σ 132.

R. A., $1^h\ 26^m.7$ Dec., 16° 26′

Date.	Sid. T.	p	s	Ocular.	Remarks.
	h	° ′	″		
1903.811	22.9	350 37	39.12	X	
.814	0.9	349 36	39.31	X	
.817	23.8	350 31	39.49	X	
1903.814	3 *n*	350 15	39.31		

υ Andromedae.

R. A., $1^h\ 30^m.9$ Dec., 40° 54′

1903.811	22.3	281 31	279.88	X	
.814	23.9	281 36	280.37	X	
.817	22.9	281 33	280.33	X	
1903.814	3 *n*	281 33	280.19		

Σ 142.

R. A., $1^h\ 34^m.5$ Dec., 14° 45′

1903.811	23.1	165 56	14.70	X	
.814	1.6	345 20	14.79	X	
.817	0.5	345 28	14.63	X	
1903.814	3 *n*	345 28	14.71		

107 Piscium.

R. A., $1^h\ 37^m.1$ Dec., 19° 47′

1903.811	23.4	348 18	91.30	X	
.814	1.8	348 20	91.35	X	
.817	0.7	348 4	91.39	X	
1903.814	3 *n*	348 14	91.35		

6 Persei.

R. A., $2^h\ 7^m.0$ Dec., 50° 36′

Date.	Sid. T.	p	s	Ocular.	Remarks.
	h	° ′	″		
1902.058	4.3	70 56	132.43	X	
.064	4.8	70 52	132.45	X	
.116	6.4	71 1	132.44	X	
1902.079	3 *n*	70 56.3	132.44		

o Ceti.

R, A., $2^h\ 14^m.3$ Dec., —3° 26′

1903.082	5.1	79 47	117.08	X	Very red.
.089	4.1	80 4	116.50	X	
.108	4.9	79 49	116.04	X	Very red.
.119	5.4	79 45	116.39	X	Distance poor. Wind.
1903.100	4 *n*	79 51.2	116.50		

Σ 296. ϑ Persei.

R. A., $2^h\ 37^m.3$ Dec., +48° 48′

1902.121	6.6	298.7	17.41	X	

ϑ Persei.

R. A., $2^h\ 37^m.3$ Dec., +48° 48′

1902.058	4.7	224 11	72.63	X	
.064	5.0	223 51	72.88	X	
.121	6.3	233 54	72.73	X	
1902.081	3 *n*	223 59	72.75		

η Persei.

R. A., 2^h $43^m.4$ Dec.. 55° 29′

Date.	Sid. T.	p	s	Ocular.	Remarks.
	h	° ′	″		
1903.082	6.4	300 24	28.37	X	
.097	5.7	300 9	28.33	X	Good.
.100	5.9	300 25	27.99	V	Good.
1903.093	3 *n*	300 19.3	28.23		

41 Arietis. A. B.

R. A., 2^h $44^m.1$ Dec,, 26° 51′

1903.082	5.6	271 34	22.94	X	3—11.5 *m.*
.119	4.7	272 26	22.67	X	—11.2
1903.100	2 *n*	272 0	22.80		

41 Arietis. A. C.

R, A., 2^h $44^m.1$ Dec., 26° 51′

1903.082	5.3	208 25	32.46	X	3—11 *m.*
.119	4.9	207 58	32.30	X	—11
1903.100	2 *n*	208 12	32.38		

41 Arietis. A. D.

R. A., 2^h $44^m.1$ Dec., 26° 51′

1903.082	5.8	231 26	125.64	X	
.119	5.2	231 28	125.43	X	
1903.100	2 *n*	231 27.0	125.54		

16 Persei.

R. A., $2^h\ 44^m.3$ Dec., $37°\ 54'$

Date.	Sid. T.	p	s	Ocular.	Remarks.
	h	° ′	″		
1903.814	0.3	145 20	253.00	X	
.817	23.2	145 19	252.88	X	
1904.182	7.0	145 22	252.70	X	
1903.938	3 *n*	145 20	252.86		

96, κ Ceti.

R. A., $3^h\ 14^m.1$ Dec., $+3°\ 0'$

1904.135	5.3	156 41	268.82	X	
.182	7.4	156 48	268.73	X	
.223	7.2	156 43	268.65	X	
1904.180	3 *n*	156 44	268.73		

Σ 412, 7 Tauri.

R. A., $3^h\ 28^m.5$ Dec., $24°\ 8'$

1904.135	5.7	59 25	22.29	X	
.182	8.1	59 17	21.91	X	
.237	7.9	59 36	22.57	X	
1904.185	3 *n*	59 23	22.25		

40, ο Persei.

R. A., $3^h\ 36^m.1$ Dec., $33°\ 39'$

1903.108	5.3	236 48	20.18	X	Difficult.
.119	5.7	236 47	20.23	X	
1903.113	2 *n*	236 48	20.20		

43 Persei.

R. A., 3^h $49^m.8$ Dec., 50° 24′

Date.	Sid. T.	p	s	Ocular.	Remarks.
	h	° ′	″		
1903.141	6.7	30 2	75.29	X	
.143	7.9	29 41	75.08	X	
.193	7.5	29 35	75.42	X	
1903.159	3 *n*	29 46	75.26		

A′ Tauri.

R. A., 3^h $58^m.8$ Dec., 21° 48′

Date.	Sid. T.	p	s	Ocular.	Remarks.
1903.119	7.5	189 12	137.53	X	
.141	8.9	189 7	137.55	X	
.143	6.9	189 8	137.79	X	
1903.134	3 *n*	189 9.0	137.62		

39 Tauri.

R. A., 3^h $59^m.4$ Dec., 21° 44′

Date.	Sid. T.	p	s	Ocular.	Remarks.
1904.135	5.9	2 57	169.12	X	
.182	8.4	2 51	169.03	X	
.237	8.2	3 2	168.97	X	
1904.185	3 *n*	2 57	169.04		

OΣ 531. A. B.

R. A., 4^h $0^m.9$ Dec., 37° 49′

Date.	Sid. T.	p	s	Ocular.	Remarks.
1904.182	8.0	128.2	1.87	X	
.223	8.9	130.5	1.76	X	
1904.202	2 *n*	129.35	1.82		

O Σ 531. A. C.

R. A., $4^h\ 0^m.9$ Dec., 37° 49′

Date.	Sid. T.	p	s	Ocular.	Remarks.
	h	° ′	″		
1904.182	8.8	209 4	234.16	X	
.223	8.7	209 6	234.34	X	
.237	9.1	209 1	234.14	X	
1904.214	3 *n*	209 4	234.21		

40 Eridani. A. B.

R. A., $4^h\ 10^m.8$ Dec., −7° 52′

1902.047	4.8	105 32	82.18	X	Good.
.058	4.9	105 38	81.99	X	
.064	5.7	105 30	91.93	X	
1907.126	5.4	105 29	82.71	X	
1902.056	3 *n*	105 33	82.03		
1907.126	1 *n*	105 29	82.71		

40 Eridani. A. D.

R. A., $4^h\ 10^m.7$ Dec., −7° 48′

1907.126	5.2	7 29.2	207.63	V	Very difficult star.—12 *m*.
.149	5.7	7 2.8	207.47	X	—12
.154	5.9	7 25.7	207.06	X	—12
1907.143		7 19.2	207.39		

40 Eridani. A. E.

R. A., $4^h\ 10^m.8$ Dec., $-7°\ 52'$

Date.	Sid. T.	p	s	Ocular.	Remarks.	
	h	° ′	″			
1902.042	4.9	55 51	90.99	X		—12 *m.*
.047	4.5	55 41	91.13	X	Good.	—11
.058	5.2	55 47	91.63	X	Very faint.	—13
.064	5.4	56 25	91.37	X	Difficult.	—12
1907.149	5.9	51 58	110.19	X		—11.5
1902.053	4 *n*	55 56	91.28			
1907.159	1 *n*	51 58	110.19			

ϕ Tauri.

R. A., $4^h\ 14^m.2$ Dec., $27°\ 7'$

1904.135	6.5	248 1	52.30	X	
.182	9.2	247 42	52.26	X	
.237	8.9	247 55	52.24	X	
1904.185	3 *n*	247 53	52.27		

α Tauri.

R. A., $4^h\ 30^m.2$ Dec., $+16°\ 18'$

1902.121	7.0	34 12	118.38	X	
.129	5.6	34 5	118.12	X	
.171	7.8	34 4	118.17	X	Good.
1902.140	3 *n*	34 7.0	118.22		

1 Orionis.

R. A., $4^h\ 44^m.4$ Dec., $6°\ 47'$

1902.129	5.9	137 30	96.37	X	
.141	5.8	137 20	96.32	X	
.201	7.3	137 31	96.05	V	
1902.157	3 *n*	137 27.0	96.25		

13 Orionis. A. B.

R. A., $5^h\ 2^m.2$ Dec., 9° 21′

Date.	Sid. T.	p		s	Ocular.	Remarks.
	h	°	′	″		
1904.135	7.2	264	1	124.01	X	
.237	8.4	264	0	123.69	X	
.256	9.2	264	3	124.07	X	
1904.209	3 n	264	1.3	123.92		

13 Orionis. A. C.

R. A., $5^h\ 2^m.2$ Dec., 9° 21′

1904.135	7.2	268	3	402.11	X	
.237	8.6	268	1	402.64	X	
.256	8.9	268	5	403.41	X	
1904.209	3 n	268	3.0	402.72		

Σ 634. 19 H. Camelop.

R. A., $5^h\ 6^m.1$ Dec., +79° 6′

1902.110	6.2	18	38	13.25	X	Good.
.116	5.7	19	6	13.30	III	
1902.113	2 n	18	52	13.28		

α Aurigae.

R. A., $5^h\ 9^m.3$ Dec., 45° 54′

1904.223	9.2	144	47	148.75	X	
.237	9.3	144	43	148.68	X	
.259	9.9	144	37	148.91	X	
1904.240	3 n	144	42.3	148.78		

λ Aurigae.

R. A., $5^h\ 12^m.1$ Dec., 40° 1′

Date.	Sid. T.	p	s	Ocular.	Remarks.
	h	° ′	″		
1903.141	9.5	6 50	134.98	X	
.143	8.2	6 43	134.55	X	
.193	7.9	6 45	134.93	X	
1903.159	3 *n*	6 46.0	134.82		

111. Tauri.

R. A., $5^h\ 18^m.6$ Dec., 17° 17′

1903.119	7.8	270 53	80.62	X	
.141	9.2	270 58	80.06	X	
.143	7.2	250 57	80.50	X	
1903.134	3 *n*	270 56	80.39		

ϑ′ Orionis. A. E.

R. A., $5^h\ 30^m.4$ Dec., —5° 27′

1904.182	7.7	352.7	4.12	X	
.223	7.5	350.4	3.98	X	
.237	7.6	351.0	3.84	X	
1904.214	3 *n*	351.37	3.98		

ϑ′ Orionis. C. F.

R. A., $5^h\ 30^m.4$ Dec., —5° 27′

1904.182	7.9	118.3	4.03	X	6 —11.5 *m.*
.223	7.6	119.9	3.70	X	6 —11.5
.237	7.7	122.0	4.17	X	5.5—10.8
1904.214	3 *n*	120.07	3.97		

South. 503.

R. A., $5^h\ 50^m.3$ Dec., $13°\ 55'$

Date.	Sid. T.	p	s	Ocular.	Remarks.
	h	°	″		
1904.237	9.6	329.0	12.38	X	
.256	9.4	329.6	12.35	X	
.259	9.1	330.3	12.23	X	
1904.251	3 *n*	329.63	12.32		

θ Aurigae. OΣ 545.

R. A., $5^h\ 52^m.9$ Dec., $+37°\ 12'$

1903.228	7.7	337.1	2.47	VII	Good.

θ Aurigae. A. C.

R. A., $5^h\ 52^m.9$ Dec., $+37°\ 12'$

1903.193	7.2	294 14	47.20	X	—11 *m.*
.228	7.3	293 44	47.28	X	—11
.237	8.0	294 12	47.84	X	—11.2
1903.219	3 *n*	294 3	47.44		

θ Aurigae. A. D.

R. A., $5^h\ 52^m.9$ Dec., $+37°\ 12'$

1903.193	6.9	339 38	128.78	X	
.228	7.6	349 42	129.07	X	
.237	7.7	349 42	129.20	X	
1903.219	3 *n*	349 41.0	129.02		

15 Geminorum.

R. A., 6^h $21^m.8$ Dec., 20° 51′

Date.	Sid. T.	p	s	Ocular.	Remarks.
	h	° ′	″		
1904.256	9.7	204 16	29.47	X	
.259	9.3	204 0	29.20	X	
.297	9.7	204 2	29.34	X	
1904.271	3 *n*	204 6.0	29.34		

6 Lyncis.

R. A., 6^h $22^m.1$ Dec., 58° 14′

1904.223	9.4	117 18	180.04	X	
.256	9.9	117 18	179.83	X	
.259	10.7	117 8	179.87	X	
1904.246	3 *n*	117 14.7	179.91		

8 Lyncis. A. B.

R. A., 6^h $28^m.6$ Dec., 61° 34′

1904.223	9.7	80 20	155.70	X	
.256	10.6	80 19	155.71	X	
.259	10.9	80 15	155.86	X	
1904.246	3 *n*	80 18.0	155.76		

8 Lyncis. A. C.

R. A., 6^h $28^m.6$ Dec., 61° 34′

1904.223	9.9	94 35	374.38	X	

O Σ 154.

R. A., 6h 37m.3 Dec., 40° 44′

Date.	Sid. T.	p	s	Ocular.	Remarks.
	h	° ′	″		
1904.256	10.3	122 19	25.72	X	
.259	10.2	122 7	26.14	X	
.297	10.0	122 22	25.69	X	
1904.271	3 *n*	122 16	25.85		

56 Aurigae.

R. A., 6h 39m.5 Dec., 43° 41′

1903.141	9.7	23 46	44.19	X	
.193	8.2	23 33	44.31	X	
.228	8.0	23 40	44.22	X	
1903.187	3 *n*	23 40	44.24		

15 Lyncis.

R. A., 6h 48m.7 Dec., +58° 33′

1902.196	8.7	167 29	199.45	X	Distance poor.
.201	9.5	167 28	200.37	X	
.223	9.6	167 32	200.13	X	
.228	9.7	167 33	199.92	X	Blurred.
1902.212	4 *n*	167 30.5	199.97		

45 Geminorum. O Σ 165.

R. A., 7h 2m.6 Dec. 16° 5′

1903.349	11.1	39 52	3.97	X	Difficult.
.396	12.2	43 2	3.76	X	
1903.372	2 *n*	41 27	3.86		

CASTOR. A. C.

R. A., $7^h\ 28^m.2$ Dec., 32° 7′

Date.	Sid. T.	p	s	Ocular.	Remarks.
	h	° ′	″		
1902.129	6.4	163 56	73.08	X	
.228	9.1	164 35	73.06	X	
.234	8.7	164 19	72.81	X	
1902.197	3 *n*	164 17	72.98		

CASTOR. A. D.

R. A., $7^h\ 28^m.2$ Dec., 32° 7′

Date.	Sid. T.	p	s	Ocular.	Remarks.
1902.129	6.7	222 56	206.21	X	
.228	9.3	222 54	206.83	X	
.234	8.4	222 45	206.82	X	
1902.197	3 *n*	222 51.7	206.62		

PROCYON. A. D.

R. A., $7^h\ 34^m.2$ Dec., 5° 29′

Date.	Sid. T.	p	s	Ocular.	Remarks.
1902.196	9.6	345.30	60.87	X	....12 *m*. Very difficult.
.201	8.2	345.51	60.83	X	....12.5
.223	8.2	346.11	60.70	X	12
1902.207	3 *n*	345.51	60.80		

POLLUX. A. B.

R. A., $7^h\ 39^m.2$ Dec., 28° 16′

Date.	Sid. T.	p	s	Ocular.	Remarks.
1002.201	8.6	76 17	244.22	X	
.226	7.8	76 4	244.70	X	
.228	8.2	76 15	244.35	X	
1902.218	3 *n*	76 12.0	244.42		

PROCYON. A. B.

R. A., 7^h $34^m.2$ Dec., 5° 29′

Date.	Sid. T.	$\Delta\delta$		Ocular.	Remarks.
	h m	″			
1902.196	9 18	+128.96	....	X	OΣ Comparison star.
.201	7 54	128.78	....	X	
.223	7 51	128.88	....	X	
1903.237	8 17	129.83	....	X	Half observation.
.240	8 2	129.99	....	X	
.270	9 0	129.58	....	X	
1904.256	8 25	131.12	....	X	
.259	8 32	130.89	....	X	
.297	9 15	130.98	....	X	
1902.207	3 *n*	128.87	....		
1903.249	3 *n*	129.80	....		
1904.271	3 *n*	131.00	....		

PROCYON. A. C.

R. A., 7^h $34^m.2$ Dec., 5° 29′

1902.196	9 18	+80.67	....	X	OΣ Comparison star.
.201	7 53	80.91	....	X	
.223	7 51	80.97	....	X	
1903.237	8 18	82.11	....	X	Half observation.
.240	8 4	81.93	....	X	
.270	9 0	81.69	....	X	
1904.256	8 30	82.84	....	X	
.259	8 38	82.95	....	X	
.297	9 21	82.81	....	X	
1902.207	3 *n*	80.85	....		
1903.249	3 *n*	81.91	....		
1904.271	3 *n*	82.87	....		

POLLUX. B. C.

R. A., $7^h\ 39^m.2$ Dec., 28° 16′

Date.	Sid. T.	p	s	Ocular.	Remarks.
	h	° ′	″		
1902.201	9.0	269 28	57.27	X	
.226	8.1	269 40	57.47	X	
.228	8.5	269 47	57.53	X	
1902.218	3 n	269 38	57.42		

POLLUX. A. D.

R. A., $7^h\ 39^m.2$ Dec., 28° 16′

1904.297	10.5	90 5	221.33	X	—11.5 m.
.321	19.2	90 10	220.92	X	—11.
1904.309	2 n	90 7.5	221.12		

POLLUX. A. E.

R. A., $7^h\ 39^m.2$ Dec., 28° 16′

1904.297	10.7	328 37	170.05	X	
.321	10.4	328 16	170.11	X	
1904.309	....	328 26.5	170.08		

π GEMINORUM.

R. A., $7^h\ 41^m.1$ Dec., +33° 40′

1903.193	8.9	212 7	21.45	X	4—11 m.
.196	6.7	211 30	21.33	X	5—11
.228	8.4	213 14	21.40	X	5—11
1903.206	3 n	212 17	21.39		

29 Monocerotis. A. B.

R. A., $8^h\ 3^m.6$ Dec., —2° 41′

Date.	Sid. T.	p	s	Ocular.	Remarks.
	h	° ′	″		
1903.119	8.0	105 27	31.94	X	6—11.5 *m.*
.141	8.4	104 32	31.91	X	—10.
.193	8.6	104 58	31.71	X	—10.5
1903.151	3 *n*	104 59	31.85		

29 Monocerotis. A. C.

R. A., $8^h\ 3^m.6$ Dec., —2° 41′

1903.141	8.6	245 5	66.17	X	
.193	8.4	245 12	66.29	X	
.237	8.6	245 23	66.32	X	
1903.190	3 *n*	245 13	66.26		

Arg. 167. A. B.

R. A., $8^h\ 5^m.4$ Dec., 32° 46′

1904.297	11.2	76 6	223.05	X	
.321	11.2	76 4	223.70	X	
1904.309	2 *n*	76 5.0	223.38		

Arg. 167. A. C.

R. A., $8^h\ 5^m.4$ Dec., 32° 46′

1904.297	11.0	318 15	52.60	X	6.5—11 *m.*
.321	11.0	317 57	52.69	X	7—10.5
1904.309	2 *n*	318 6	52.64		

Br. 1169.

R. A., $8^h\ 8^m.7$ Dec., $59° 30'$

Date.	Sid. T.	p	s	Ocular.	Remarks.
	h	° ′	″		
1903.196	7.1	8 50	96.09	X	
.228	10.8	8 40	96.03	X	
.237	9.1	8 50	96.24	X	
1903.220	3 *n*	8 46.7	96.12		

Camelop. 176.

R. A., $8^h\ 9^m.7$ Dec., $72° 43'$

1903.196	7.3	86 54	43.50	X	
.228	11.0	86 28	43.61	X	
.237	8.9	86 55	43.67	X	
1903.220	3 *n*	86 46	43.59		

σ 294.

R. A., $8^h\ 17^m.9$ Dec., $42° 20'$

1904.297	11.7	170 3	77.99	X	
.321	11.5	169 48	77.87	X	
1904.309	2 *n*	169 56	77.93		

δ Cancri.

R. A., $8^h\ 39^m.0$ Dec., $+18° 32'$

1902.129	7.0	106 53	40.09	X	
.149	7.6	108 11	39.79	X	Difficult.
.207	7.4	107 2	40.50	X	
1902.162	3 *n*	107 22	40.13		

Σ 1263.

R. A., $8^h\ 38^m.6$ Dec., 42° 3′

Date.	Sid. T.	p	s	Ocular,	Remarks.
	h	° ′	″		
1904.297	12.0	20 33	57.94	X	
.321	11.7	20 23	57.98	X	
1904.309	2 *n*	20 28	57.96		

10 Ursae Majoris. A. B.

R. A., $8^h\ 54^m.2$ Dec., +42° 11′

1904.321	12.2	200 40	131.65	X	
.371	12.3	200 53	131.64	X	
1904.346	2 *n*	200 46.5	131.64		

10 Ursae Majoris. A. C.

R. A., $8^h\ 54^m.2$ Dec., +42° 11′

1904.321	12.0	109 16	221.56	X	
.371	12.2	109 28	221.50	X	
1904.346	2 *n*	109 22.0	221.53		

75 Cancri.

R. A., $9^h\ 2^m.9$ Dec., +27° 3′

1904.321	12.4	39 44	109.47	X	
.371	11.8	39 51	110.13	X	
1904.346	2 *n*	39 47.5	109.80		

81, π Cancri.

R. A., $9^h\ 6^m.8$ Dec., 15° 24′

Date.	Sid. T.	p		s	Ocular.	Remarks.
	h	°	′	″		
1904.297	12.3	229	25	223.18	X	
.321	10.7	229	20	223.06	X	
.371	11.6	229	29	223.28	X	
1904.330	3 *n*	229	24.7	223.17		

θ Hydrae.

R. A., $9^h\ 9^m.2$ Dec., +2° 45′

Date.	Sid. T.	p		s	Ocular.	Remarks.
1902.196	9.9	179	38	45.37	X	....10 *m.*
.201	9.2	179	54	45.37	X	....10.5
.207	8.2	179	50	44.98	X	11
1902.201	3 *n*	179	47	45.24		

σ 331.

R. A., $9^h\ 9^m.4$ Dec., 23° 48′

Date.	Sid. T.	p		s	Ocular.	Remarks.
1904.371	12.6	82	42	59.91	X	
.459	14.2	82	33	60.27	X	
1904.415	2 *n*	82	38	60.09		

40 Lyncis.

R. A., $9^h\ 15^m.0$ Dec., 34° 49′

Date.	Sid. T.	p		s	Ocular.	Remarks.
1904.371	12.9	36	46	210.14	X	
.459	13.8	36	57	210.15	X	
.472	14.1	36	39	209.87	X	
1904.433	3 *n*	36	47.3	210.05		

40 Lyncis. B. C.

R. A., 9^h $15^m.0$ Dec., 34° 49′

Date.	Sid. T.	p	s	Ocular.	Remarks.
	h	°	″		
1904.371	13.1	321.2	17.04	X	

41 Lyncis. A. B.

R. A., 9^h $22^m.1$ Dec., 46° 2′

Date.	Sid. T.	p	s	Ocular.	Remarks.
1904.459	14.9	161 42	79.84	X	
.472	15.0	161 41	79.76	X	
1904.466	2 *n*	161 42	79.80		

41 Lyncis. A. C.

R. A., 9^h $22^m.1$ Dec., 46° 2′

Date.	Sid. T.	p	s	Ocular.	Remarks.
1904.472	15.0	79 44	83.11	X	....10.5 *m.*

1351, 23 h Ursae Majoris.

R. A., 9^h $23^m.6$ Dec., 63° 30′

Date.	Sid. T.	p	s	Ocular.	Remarks.
1903.196	7.7	270 21	22.43	X	
.228	11.2	270 26	22.98	X	
.237	9.7	270 43	22.80	X	
1903.220	3 *n*	270 30	22.74		

6 Leonis.

R. A., 9^h $26^m.6$ Dec., 10° 10′

Date.	Sid. T.	p	s	Ocular.	Remarks.
1903.196	8.1	74 34	37.11	X	
.228	9.0	74 26	37.15	X	
.237	9.9	74 13	36.98	X	
1903.220	3 *n*	74 24	37.07		

7 Leonis.

R. A., $9^h\ 30^m.4$ Dec., 14° 50′

Date.	Sid. T.	p	s	Ocular.	Remarks.
	h	° ′	″		
1903.196	8.4	79 59	40.91	X	
.228	9.2	79 39	41.31	X	
.237	10.2	79 54	41.07	X	
1903.220	3 *n*	79 51	41.10		

9 Sextantis.

R. A., $9^h\ 48^m.9$ Dec., 5° 25′

1903.196	8.6	290 1	52.51	X	
.228	9.4	290 6	52.43	X	
.237	10.5	289 56	52.59	X	
1903.220	3 *n*	290 1	52.51		

Leonis.

R. A., $10^h\ 3^m.0$ Dec., 12° 27′

1903.196	9.0	306 50	176.32	X	
.228	9.7	306 44	176.86	X	
.237	10.7	306 36	176.54	X	
1903.220	3 *n*	306 43	176.57		

γ Leonis. A. C.

R. A., $10^h\ 14^m.4$ Dec., 20° 21′

1904.371	13.6	291 18	251.53	X	
.459	14.4	291 12	251.69	X	
.472	14.3	291 21	251.81	X	
1904.434	3 *n*	291 17.0	251.68		

γ Leonis. A. D.

R. A., $10^h\ 14^m.4$ Dec., 20° 21′

Date.	Sid. T.	p	s	Ocular.	Remarks.
	h	° ′	″		
1904.371	13.9	302 32	332.81	X	
.459	14.6	302 26	333.34	X	
.472	14.6	302 27	332.88	X	
1904.434	3 *n*	302 28.3	333.01		

σ 362.

R. A., $10^h\ 18^m.1$ Dec., +6° 12′

1904.483	14.9	347 52	58.51	X	
.488	14.8	348 0	58.47	X	
1904.486	2 *n*	347 56	58.49		

χ Leonis.

R. A., $10^h\ 59^m.9$ Dec., 7° 53′

1907.231	9.6	304 17	280.69	X	
.240	9.4	304 15	280.48	X	
1907.236	2 *n*	304 16.0	280.58		

σ 377.

R. A., $11^h\ 5^m.3$ Dec., 66° 34′

1904.535	15.6	223 0	66.54	X	
.560	17.4	223 1	66.41	X	
1904.548	2 *n*	223 0	66.48		

Σ 1517. AB., C.

R. A., 11h 8m.4 Dec., 20° 41′

Date.	Sid. T.	p	s	Ocular.	Remarks.
	h	° ′	″		
1904.472	15.6	102 31	209.27	X	
.483	15.2	102 19	208.99	X	
1904.478	2 *n*	102 25.0	209.13		

Σ 1516. A. B.

R. A., 11h 8m.6 Dec., 74° 1′

1904.521	15.5	98 24	20.85	X	
.535	15.8	98 49	21.05	X	
.560	16.9	98 54	20.77	X	
1904.539	3 *n*	98 42	20.89		

Σ 1516. A. C.

R. A., 11h 8m.6 Dec., 74° 1′

1904.521	15.7	302 5	7.18	X	7–10.5 *m.*
.535	16.0	298 25	7.16	X	7–11
.560	17.1	297 39	7.05	X	7–11
1904.539	3 *n*	299 23	7.13		

δ Leonis.

R. A., 11h 8m.7 Dec., +21° 5′

1902.207	7.9	344 24	187.42	X	
.250	10.6	344 30	188.12	X	
.253	10.1	344 23	188.04	X	
1902.237	3 *n*	344 25.7	187.85		

81 Leonis.

R. A., 11h 20m.4 Dec., 17° 0′

Date.	Sid. T.	p	s	Ocular.	Remarks.
	h	° ′	″		
1903.196	9.2	348 3	56.13	X	5 —10.5 *m.*
.228	9.9	347 41	56.03	X	6.5—10.5
.237	10.9	347 40	56.11	X	6 —10.5
1903.220	3 *n*	347 48	56.09		

61 Ursae Majoris.

R. A., 11h 35m.8 Dec., +34° 47′

1902.269	9.5	101 17	159.35	V	
.398	13.3	101 16	159.21	V	
1902.323	2 *n*	101 16.5	159.28		

62 Ursae Majoris.

R. A., 11h 36m.4 Dec., 32° 18′

1904.459	15.2	299 30	85.59	X	
.472	15.3	299 39	85.49	X	
1904.466	2 *n*	299 34.5	85.54		

β Virginis.

R. A., 11h 45m.5 Dec., +2° 20′

1902.250	11.3	284 13	241.59	X	
.269	10.2	284 16	241.62	V	
1902.260	2 *n*	284 14.5	241.60		

Σ 1607.

R. A., 12^h $6^m.5$ Dec., 36° 39′

Date.	Sid. T.	p	s	Ocular.	Remarks.
	h	° ′	″		
1904.483	15.4	2 14	29.01	X	
.521	15.2	3 1	29.31	X	
1904.502	2 *n*	2 38	29.16		

12 Comae.

R. A., 12^h $17^m.5$ Dec., 26° 24′

1903.228	10.2	167 17	65.34	X	
.237	11.2	167 16	65.11	X	
.240	9.9	167 21	65.20	X	
1903.235	3 *n*	167 18	65.22		

Σ 1658. A. B.

R. A., 12^h $30^m.0$ Dec., 8° 0′

1904.488	15.3	0.8	2.31	X	
.521	15.9	0.4	2.34	X	
1904.504	2 *n*	0.6	2.32		

Σ 1658. A. C.

R. A., 12^h $30^m.0$ Dec., +8° 0′

1904.488	15.1	260 3	108.33	X	
.521	16.1	260 2	108.27	X	
1904.504	2 *n*	260 2.5	108.30		

γ Virginis. A. C.

R. A., 12^h $36^m.6$ Dec., $-0° 54'$

Date.	Sid. T.	p	s	Ocular.	Remarks.
	h	° ′	″		
1904.474	14.2	180 3	252.24	X	
.483	14.3	179 59	252.11	X	
.488	14.3	179 53	251.98	X	
1904.482	3 *n*	179 58.3	252.11		

Σ 1678.

R. A., 12^h $40^m.4$ Dec., $14° 55'$

1904.483	16.0	194 8	32.41	X	
.488	15.9	193 47	32.61	X	
1904.486	2 *n*	193 58	32.51		

33 Virginis.

R, A., 12^h $41^m.3$ Dec., $10° 6'$

1904.483	15.7	189 55	173.15	X	
.488	15.6	190 3	172.59	X	
1904.486	2 *n*	189 59.0	172.87		

Σ 1682. Piazzi XII, 196.

R. A., 12^h $45^m.7$ Dec., $-9° 48'$

1903.237	11.5	304 30	31.66	X	
.292	11.9	304 50	31.82	X	
.313	11.5	304 6	31.44	V	
1903.281	3 *n*	304 29	31.64		

δ Virginis.

R. A., $12^h\ 50^m.6$ Dec., 3° 57′

Date.	Sid. T.	p	s	Ocular.	Remarks.
	h	° ′	″		
1907.480	15.3	183 38	159.08	X	3—11 *m.*
.483	16.1	138 46	159.47	X	3—10
1907.482	2 *n*	138 42.0	159.28		

42 Comae.

R. A., $13^h\ 5^m.1$ Dec., +18° 3′

1902.253	11.1	327 46	117.17	X	
.398	13.9	327 31	117.44	V	
.494	15.1	327 43	116.95	X	
1902.382	3 *n*	327 40.0	117.19		

43 Comae.

R. A., $13^h\ 7^m.3$ Dec., +28° 22′

1902.253	10.4	253 51	93.97	X	
.398	14.2	253 51	93.39	V	
.486	16.2	253 47	93.91	V	
1902.382	3 *n*	253 50	93.76		

σ 434.

R. A., $13^h\ 9^m.7$ Dec,, —10° 50′

1904.474	14.5	50 30	72.31	X	
.483	14.5	50 30	72.29	X	
1904.478	2 *n*	50 30	72.30		

61 Virginis.

R. A., $13^h\ 13^m.2$ Dec., —17° 45′

Date.	Sid. T.	p	s	Ocular.	Remarks.
	h	° ′	″		
1907.480	15.7	29 4	231.52	X	
.483	15.2	29 6	231.42	X	
1907.482	2 *n*	29 5.0	231.47		

70 Virginis.

R. A., $13^h\ 23^m.5$ Dec., 14° 19′

1904.488	16.1	138 4	288.92	X	
.521	16.5	138 14	288.90	X	
.535	16.6	138 9	289.09	X	
1904.515	3 *n*	138 9.0	288.97		

72 Virginis.

R. A., $13^h\ 26^m.8$ Dec., —5° 57′

1903.292	12.5	17 5	29.53	X	
.313	11.8	17 20	29.26	V	
.316	12.7	16 27	29.61	V	
1903.307	3 *n*	16 57	29.47		

η Bootis.

R. A., $13^h\ 49^m.9$ Dec., 18° 54°

1904.521	16.7	106 25	113.52	X	
.535	17.0	106 21	113.44	X	
1904.528	2 *n*	106 23.0	113.48		

ι Bootis, Σ 3124.

R. A., $14^h\ 12^m.7$ Dec., +51° 50′

Date.	Sid. T.	p	s	Ocular.	Remarks.
	h	° ′	″		
1902.480	17.0	32 53	38.47	V	

θ Bootis.

R, A., $14^h\ 23^m.4$ Dec., +52° 20′

Date.	Sid. T.	p	s	Ocular.	Remarks.
1902.669	18.8	182 7	69.09	X	4—10 *m.*
.674	20.0	181 52	69.11	X	4—11
.679	19.6	182 2	69.12	X	4—10.5
.883	21.2	182 26	69.64	X	......
1902.726	4 *n*	182 7	69.24		

ρ Bootis.

R. A., $14^h\ 27^m.6$ Dec., 30° 49′

Date.	Sid. T.	p	s	Ocular.	Remarks.
1907.480	16.5	335 23	49.43	X	—12 *m.*
.486	16.5	335 22	49.21	X	—12
.546	17.5	335 24	49.52	X	—12
1907.504	3 *n*	335 23	49.39		

γ Bootis.

R. A., $14^h\ 28^m.1$ Dec., 38° 45′

Date.	Sid. T.	p	s	Ocular.	Remarks.
1907.480	16.9	107 51	30.62	X	—13 *m.* Of the last de-
.546	17.3	106 48	30.55	X	—13 gree of difficulty
1907.513	2 *n*	107 20	30.58		

σ Bootis. A. B.

R. A., $14^h\ 30^m.4$ Dec., 30° 11′

Date.	Sid. T.	p	s	Ocular.	Remarks.
	h	° ′	″		
1902.593	17.5	82 24	237.08	X	
.669	20.6	82 26	237.08	X	Difficult.
.674	18.9	82 24	236.95	X	
1902.645	3 *n*	82 24.7	237.04		

σ Bootis. B. C.

R. A., $14^h\ 30^m.4$ Dec., 30° 11′

1902.593	17.7	180 6	60.28	X	10 *m.*
.674	19.2	180 10	60.45	X	11
.679	19.3	180 27	60.04	X	11
1902.649	3 *n*	180 14	60.26		

Sh. 190. A. B.

R. A., $14^h\ 51^m.6$ Dec., −20° 57′

1927.546	16.9	294 0	17.78	X	

Sh. 190. A. E.

R. A., $14^h\ 51^m.6$ Dec., −20° 57′

1907.488	15.8	185 25	51.69	X	....13 *m.* Very difficult.

SH. 190. A. F.

R. A., 14h 51m.6 Dec., —20° 57′

Date.	Sid. T.	p	s	Ocular.	Remarks.
	h	° ′	″		
1907.488	16.1	324 19	180.66	X	—12 *m.*
.546	16.6	323 56	180.35	X	—12
1907.517	2 *n*	324 7.5	180.50		

18 LIBRAE.

R. A., 14h 53m.5 Dec., —10° 45′

1903.316	13.0	38 36	19.34	V	10.5 *m.*
.338	14.3	37 18	20.19	X	10.5 Poor.
.349	13.9	38 29	19.73	X	10.5
1903.334	3 *n*	38 8	19.75		

5 SERPENTIS.

R. A., 15h 14m.2 Dec., +2° 9′

1903.313	12.1	37 18	10.80	V	10.5 *m.*
.338	13.1	38 12	10.76	X	11
.343	13.0	37 24	10.63	X	10.5
1903.331	3 *n*	37 38	10.71		

β SERPENTIS.

R. A., 15h 41m.6 Dec., +15° 44′

1903.313	12.7	264 30	30.81	V	4— 9 *m.*
.316	13.2	263 59	30.92	V	4—10
.338	13.2	264 4	30.92	X	3—10.5
1903.322	3 *n*	264 11	30.88		

39 Serpentis.

R. A., $15^h\ 48^m.5$ Dec., 13° 31′

Date.	Sid. T.	p	s	Ocular.	Remarks.
	h	° ′	″		
1904.521	17.1	117 13	98.69	X	....11.5 *m.*
.535	17.3	117 16	98.91	X	10
.560	18.1	117 26	98.79	X	12
1904.539	3 *n*	117 18.3	98.80		

γ Serpentis.

R. A., $15^h\ 51^m.8$ Dec., +16° 1′

1902.674	18.6	313 58	194.79	X	
.679	19.0	313 54	195.03	X	
.702	18.9	313 54	194.34	X	
1902.685	3 *n*	313 55.3	194.72		

Σ 1993.

R, A., $15^h\ 55^m.3$ Dec., 17° 40′

1903.715	19.4	39 15	28.99	V	
.718	19.5	38 55	28.93	V	
.721	19.5	39 1	28.70	V	
1903.718	3 *n*	39 4	28.87		

σ 502.

R. A., $15^h\ 56^m.9$ Dec., 26° 27′

1903.715	19.8	111 2	47.95	V	....11 *m.*
.718	19.8	111 5	47.78	V	10
.721	19.8	110 16	47.33	V	10
1903.718	3 *n*	110 48	47.69		

ρ Coronae.

R. A., $15^h\ 57^m.2$ Dec., $+33°\ 38'$

Date.	Sid. T.	p	s	Ocular.	Remarks.
	h	° ′	″		
1902.593	18.1	80 37	81.49	X	
.667	20.9	80 42	81.62	V	
.679	19.9	80 26	81.74	V	
1903.715	20.1	80 18	81.78	V	
.718	20.1	79 56	81.95	V	
.721	20.1	80 25	81.78	V	
1902.646	3 *n*	80 35	81.62		
1903.718	3 *n*	80 13	81.84		

49 Serpentis. A. C.

R. A., $16^h\ 8^m.6$ Dec., $+13°\ 48'$

Date.	Sid. T.	p	s	Ocular.	Remarks.
1902.574	18.5	124 57	243.08	X	
.642	19.9	125 4	241.80	X	
.679	20.3	124 57	242.68	V	
1902.632	3 *n*	124 59.3	242.52		

σ Coronae. A. C.

R. A., $16^h\ 10^m.9$ Dec., $+34°\ 6'$

Date.	Sid. T.	p	s	Ocular.	Remarks.
1902.593	12.2	86 22	61.97	X	
.637	17.5	86 10	61.77	X	
.667	20.3	86 10	61.81	V	
1902.632	3 *n*	86 14	61.85		

γ Herculis.

R. A., $16^h\ 17^m.5$ Dec., $19°\ 23'$

Date.	Sid. T.	p	s	Ocular.	Remarks.
	h	° ′	″		
1903.313	13.1	236 17	41.01	V	
.343	13.4	236 21	40.86	X	
.349	14.1	236 11	40.80	X	
1903.335	3 *n*	236 16	40.89		

23 Herculis.

R. A., $16^h\ 19^m.1$ Dec., $32°\ 34'$

1903.313	12.9	18 5	34.34	V	
.338	13.5	18 11	34.26	X	
.343	13.6	18 17	34.32	X	
1903.331	3 *n*	18 8	34.31		

ω Herculis. β 625.

R. A., $16^h\ 20^m.0$ Dec., $+14°\ 19'$

1903.445	14.2	101 13	32.50	X	....11.5 *m.*
.448	14.2	100 43	32.75	X	12
.527	15.9	101 10	31.93	X	11
.530	16.0	102 44	32.40	X	....11.5
1903.487	4 *n*	101 28	32.40		

OΣ 311.

R. A., $16^h\ 23^m.4$ Dec., $21°\ 7'$

1903.715	20.4	203.1	6.22	X	....12 *m.* Very faint.
.718	20.3	202.6	6.24	V	....12.5 Very faint.
1903.716	2 *n*	202.85	6.23		

42 Herculis.

R. A., 16h 36m.0 Dec., 49° 7′

Date.	Sid. T.	p	s	Ocular.	Remarks.
	h	° ′	″		
1903.338	13.8	92 6	24.25	X	
.343	13.9	92 17	23.81	X	
.379	13.5	92 8	23.80	X	
1903.353	3 *n*	92 10	23.95		

41 Herculis. A. B.

R. A., 16h 40m.1 Dec., 6° 17′

1902.669	19.2	190 59	163.08	X	
.674	19.5	190 56	163.35	X	
.699	18.9	190 54	163.02	X	
1902.681	3 *n*	190 56.3	163.15		

41 Herculis. A. C.

R. A., 16h 40m.1 Dec., 6° 17′

1902.669	19.4	245 50	160.71	X	
.674	19.7	245 44	160.88	X	
.699	19.1	245 52	160.58	X	
1902.681	3 *n*	245 48.7	160.72		

43 Herculis.

R. A., 16h 41m.0 Dec., 8° 46′

1903.349	14.3	229.50	82.75	X	
.379	14.6	229.57	83.00	X	
.390	13.9	229.52	82.72	X	
1903.373	3 *n*	229.53	82.82		

19 Ophiuchi.

R. A., 16^h 42^m1. Dec., $2°$ $15'$

Date.	Sid. T.	p	s	Ocular.	Remarks.
	h	° ′	″		
1903.349	14.7	90 42	22.67	X	
.379	14.4	90 50	23.07	X	
.390	14.2	90 46	22.84	X	
1903.373	3 *n*	90 46	22.86		

Σ 2120.

R. A., 17^h 0^m.4 Dec., $+28°$ $15'$

1903.417	13.2	241.2	8.12	VII	
.445	15.0	241.1	8.42	VI	
.448	13.7	240.7	8.06	X	
1903.437	3 *n*	241.0	8.20		

60 Herculis.

R. A., 17^h 0^m.7 Dec., $12°$ $53'$

1903.379	14.1	309 12	55.23	X	....11 *m.*
.390	14.4	308 56	55.01	X	....10.5
.404	14.0	309 21	54.91	X	....10.5
1903.391	3 *n*	309 10	55.05		

δ Herculis.

R. A., 17^h 10^m.9 Dec., $24°$ $57'$

1903.349	15.0	191 58	14.20	X	
.379	13.8	193 7	13.91	X	Very bad seeing.
.390	14.7	189 27	14.22	X	
1903.373	3 *n*	191 31	14.11		

72 Herculis.

R. A., $17^h\ 16^m.7$ Dec., $+32°\ 38'$

Date.	Sid. T.	p		s	Ocular.	Remarks.
	h	°	′	″		
1902.745	20.1	333	10	209.52	X	
.764	21.7	333	8	209.73	X	
.767	20.5	333	9	299.28	X	
1902.759	3 *n*	333	9.0	209.51		

54 Ophiuchi.

R. A., $17^h\ 29^m.7$ Dec., $13°\ 14'$

1903.379	15.1	71	33	21.97	X	—10.5 *m.*
.390	14.9	71	43	21.77	X	—11
.404	14.3	71	1	21.62	X	—11
1903.391	3 *n*	71	26	21.79		

ψ Draconis. A. C.

R. A., $17^h\ 45^m.0$ Dec., $72°\ 10'$

1902.712	20.3	122	39	93.33	V	
.745	21.8	122	38	93.17	V	
.764	22.1	122	48	92.70	X	
1902.740	3 *n*	122	42	93.07		

ψ Draconis. A. B.

R. A., $17^h\ 45^m.0$ Dec., $72°\ 10'$

1902.712	20.1	15.6	30.42	V	

67 Ophiuchi.

R. A., $17^h\ 55^m.6$ Dec., $2°\ 56'$

Date.	Sid. T.	p	s	Ocular.	Remarks.
	h	° ′	″		
1903.379	15.4	142 40	54.30	X	
.390	15.2	142 32	54.56	X	
1903.384	2 *n*	142 36	54.43		

70 Ophiuchi. A. a.

R. A., $18^h\ 0^m.6$ Dec., $2°\ 32'$

Date.	Sid. T.	p	s	Ocular.	Remarks.
1907.450	15.5	35 12	106.75	X	....13 *m.*
.500	17.1	35 22	106.16	X	12
.524	16.9	35 13	105.95	X	....12.5
1907.491	3 *n*	35 15.7	106.29		

70 Ophiuchi. A. b.

R. A., $18^h\ 0^m.6$ Dec., $2°\ 32'$

Date.	Sid. T.	p	s	Ocular.	Remarks.
1907.488	16.8	213 50	46.32	X	....13 *m.*
.500	16.9	214 44	45.45	X	....12.5
.524	16.8	214 14	45.84	X	13
1907.504	3 *n*	214 17	45.87		

70 Ophiuchi. A. c.

R. A., $18^h\ 0^m.6$ Dec., $2°\ 32'$

Date.	Sid. T.	p	s	Ocular.	Remarks.
1907.434	16.0	230 30	155.00	X	....12 *m.*
.450	15.2	230 33	154.95	X	....11.5
.488	16.7	230 11	154.93	X	12
1907.457	3 *n*	230 24.7	154.96		

B. D. 64°, 1253.

R. A., $18^h\ 13^m.8$ Dec., 64° 44′

Date.	Sid. T.	*p*	*s*	Ocular.	Remarks.
	h	° ′	″		
1903.721	22.2	281 24	299.08	V	

η Serpentis.

R. A., $18^h\ 16^m.2$ Dec., —2° 56′

Date.	Sid. T.	*p*	*s*	Ocular.	Remarks.
1902.609	19.8	63 55	162.13	X	
.669	20.2	64 3	162.42	X	
.693	20.5	63 57	161.68	X	
.702	19.2	63 45	162.34	X	
1902.668	4 *n*	63 55.0	169.14		

109 Herculis.

R. A., $18^h\ 19^m.4$ Dec., 21° 42′

Date.	Sid. T.	*p*	*s*	Ocular.	Remarks.
1902.593	19.6	320 33	219.44	X	
.669	20.9	320 29	219.62	X	
.674	22.0	320 37	219.31	X	
1902.645	3 *n*	320 33.0	219.46		

Σ 2322.

R. A., $18^h\ 24^m.9$ Dec., 3° 59′

Date.	Sid. T.	*p*	*s*	Ocular.	Remarks.
1903.445	15.9	168 8	19.82	X	....11 *m*.
.448	16.1	168 12	19.86	X	11
.527	16.5	168 52	20.14	X	11
1903.473	3 *n*	168 24	19.94		

29 Scuti.

R. A., $18^h\ 25^m.8$ Dec., $-10°\ 51'$

Date.	Sid. T.	p	s	Ocular.	Remarks.
	h	° ′	″		
1903.718	19.2	225 10	12.19	V	
.721	19.3	255 39	11.90	V	
.723	19.3	254 36	11.73	V	
1903.721	3 *n*	255 8	11.94		

α Lyrae.

R. A., $18^h\ 34^m.0$ Dec., $+38°\ 41'$

1902.593	19.9	162 40	52.67	X	
.642	20.7	162 46	52.84	X	
.679	22.4	162 18	52.75	V	
.745	21.3	162 40	52.91	V	
1902.665	4 *n*	162 36	52.79		

Σ 2396.

R. A., $18^h\ 43^m.8$ Dec., $10°\ 39'$

1903.712	21.2	324 25	31.47	V	
.718	20.7	324 51	31.74	V	
.721	20.7	324 33	31.75	V	
1903.714	3 *n*	324 36	31.65		

Σ 2400; A, ½ (B + C).

R. A., $18^h\ 44^m.4$ Dec., 16° 8′

Date.	Sid. T.	p	s	Ocular.	Remarks.
	h	°	″		
1904.825	21.9	181.0	3.06	III	..11.5—12 *m*. Very faint.
.833	22.3	187.2	2.90	V	.... Difficult.
1907.584	19.0	178.6	3.68	V	..11
.593	18.0	179.6	3.45	X	..11—11
.617	17.7	179.4	3.17	V	..11
1904.829	2 *n*	184.10	2.98		
1907.598	3 *n*	179.20	3.43		

ν Lyrae.

R. A., $18^h\ 46^m.2$ Dec., 32° 26′

1903.401	15.8	122 8	58.52	X	
.404	15.3	121 54	58.73	X	
.445	16.4	122 11	58.83	X	
1903.417	3 *n*	122 4	58.69		

o Draconis.

R. A., $18^h\ 49^m.7$ Dec., 59° 16′

1903.712	22.8	333 51	32.33	V	
.715	21.4	334 13	32.32	X	
.721	22.4	333 51	32.21	V	
1903.716	3 *n*	333 58	32.29		

11 Aquilae.

R. A., 18h 54m.5 Dec., 13° 29′

Date.	Sid. T.	p		s	Ocular.	Remarks.
	h	°	′	″		
1903.404	15.8	266	21	16.86	X	
.445	16.7	266	10	16 91	X	
.527	16.7	265	1	16.76	X	
1903.459	3 n	265	51	16.84		

223 Draconis.

R. A., 18h 56m.2 Dec., 62° 16′

1903.401	15.6	122	38	17.19	X	
.404	14.7	123	47	17.05	X	
.445	16.2	123	25	17.17	X	
1903.417	3 n	123	37	17.14		

31 Aquilae. A. B.

R. A., 19h 20m.2 Dec., 11° 44′

1903.712	21.5	346	26	108.50	V	
.718	21.0	346	15	108.61	V	
.723	19.6	346	32	108.70	V	
1903.728	3 n	346	24.3	108.60		

31 Aquilae. B. C.

R. A., 19h 20m.2 Dec., 11° 44′

1903.712	21.8	252	55	42.89	V	
.718	21.2	253	0	42.85	V	
.723	19.8	253	11	42.40	V	
1903.718	3 n	253	2	42.71		

21 B. VULPECULAE.

R. A., $19^h\ 21^m.3$ Dec., 24° 44′

Date.	Sid. T.	p	s	Ocular.	Remarks.
	h	° ′	″		
1902.593	20.2	75 36	31.04	V	....11 *m.*
.667	21.5	76 32	30.93	V	
.679	22.1	75 54	30.70	V	11
1902.646	3 *n*	76 1	30.89		

Σ 2521.

R. A., $19^h\ 22^m.6$ Dec., 19° 41′

Date.	Sid. T.	p	s	Ocular.	Remarks.
1903.527	17.0	37 31	24.92	X	
.530	16.3	37 26	24.85	V	
.532	17.0	38 10	24.67	X	
1903.530	3 *n*	37 42	24.81		

Σ 2532.

R. A., $19^h\ 24^m.9$ Dec., 2° 41′

Date.	Sid. T.	p	s	Ocular.	Remarks.
1903.527	17.2	4 31	33.78	X	
.530	17.2	4 49	33.77	V	
.532	17.3	4 14	33.67	X	
1903.530	3 *n*	4 31	33.74		

σ DRACONIS.

R. A., $19^h\ 33^m.0$ Dec., 69° 26′

Date.	Sid. T.	p	s	Ocular.	Remarks.
1902.712	21.1	340 16	315.86	X	
.745	22.2	340 17	315.88	X	
.764	22.4	340 19	315.00	X	
1902.740	3 *n*	340 17.3	315.58		

δ Cygni.

R. A., $19^h\ 33^m.7$ Dec., 50° 0′

Date.	Sid. T.	p		s	Ocular.	Remarks.
	h	°	′	″		
1902.667	21.9	183	10	42.88	V	....11 *m*.
.674	21.7	183	13	43.01	V	....11.5
.679	22.7	183	9	43.07	V	....11.5
1902.673	3 *n*	183	11	42.99		

17 Cygni.

R. A., $19^h\ 42^m.6$ Dec., 33° 30′

1903.712	22.3	140	28	143.34	V	
.715	21.8	140	20	142.94	X	
.718	21.8	140	36	143.09	V	
1903.715	3 *n*	140	28.0	143.12		

α Aquilae.

R. A., $19^h\ 45^m.8$ Dec., 8° 36′

1902.642	21.1	306	7	160.46	X	
.669	21.2	306	6	160.32	X	
.679	20.9	306	2	160.93	V	
1902.663	3 *n*	306	5.0	160.57		

Σ 2619. A. B.

R. A., $19^h\ 58^m.1$ Dec., 48° 0′

1902.776	0.2	63.0	4.21	V	

Σ 2619. A. C.

R. A., $19^h\ 58^m.1$ Dec., 48° 0′

Date.	Sid. T.	p	s	Ocular.	Remarks.
	h	°	″		
1903.723	22.6	319.0	15.97	V	....12.5 *m.**
.729	0.0	318.7	15.64	V	....12.5
.776	0.0	319.1	15.98	V	....12.5
1903.743	3 *n*	318.9	15.86		

* An extraordinarily difficult star. C is at the very limit of visibility under ordinary circumstances.

15 Sagittae A. B.

R. A., $19^h\ 59^m.6$ Dec., 16° 48′

1903.718	22.5	317 35	203.03	V	

15 Sagittae. A. C.

R. A., $19^h\ 59^m.6$ Dec., 16° 48′

1903.718	22.7	274 10	195.84	V	
.721	21.0	274 16	195.52	V	
.723	20.0	274 11	195.52	V	
1903.721	3 *n*	274 12.3	195.63		

15 Sagittae. C. D.

R. A., $19^h\ 59^m.6$ Dec., 16° 48′

1903.718	23.1	230 45	183.96	V	
.721	21.2	231 8	183.56	V	
.723	20.2	230 51	183.48	V	
1903.721	3 *n*	230 54.7	183.67		

σ 683.

R. A., 20h 27m.8 Dec., 48° 53′

Date.	Sid. T.	p	s	Ocular.	Remarks.
	h	° ′	″		
1903.721	22.8	278 26	60.56	V	

ω^3 Cygni.

R. A., 20h 28m.2 Dec., 48° 53′

Date.	Sid. T.	p	s	Ocular.	Remarks.
1903.527	17.7	322 58	56.68	X	
.723	22.9	322 57	57.14	V	
.729	23.7	322 56	56.86	V	
1903.660	3 *n*	322 57	56.89		

Σ 2704, β Delphini. ½ (A + B), C.

R. A., 20h 32m.9 Dec. 14° 15′

Date.	Sid. T.	p	s	Ocular.	Remarks.
1906.827	22.6	117 54	24.41	X	....12 *m.*
.830	22.5	117 57	24.77	X	12
1906.828	2 *n*	117 56	24.59		

Σ 2704, β Delphini. ½ (A + B), D.

R. A., 20h 32m.9 Dec., 14° 15′

Date.	Sid. T.	p	s	Ocular.	Remarks.
1902.770	23.0	330 12	37.01	V	
.891	23.2	330 52	37.00	V	
1902.830	2 *n*	330 32	37.00		

κ Delphini.

R. A., 20^h $34^m.3$ Dec., 9° 44′

Date.	Sid. T.	p	s	Ocular.	Remarks.
	h	° ′	″		
1902.669	21.5	303 10	15.56	X	....11.5 *m.*
.674	21.2	303 26	15.71	X	12
.688	21.1	302 30	15.70	X	....11.5
1902.677	3 *n*	303 2	15.66		

Σ 2708.

R. A., 20^h $34^m.9$ Dec., 38° 17′

1903.715	22.1	329 28	28.53	X	
.721	23.0	329 47	28.58	V	
.726	19.4	329 39	28.41	V	
1903.721	3 *n*	329 38	28.51		

ε Cygni.

R. A., 20^h $42^m.1$ Dec., 33° 36′

1902.679	23.1	301 49	40.04	X	....12 *m.* Very difficult.
.688	22.0	301 40	40.43	X	....12 Very faint and
.699	22.7	302 52	39.84	X	....12 difficult.
1902.689	3 *n*	302 7	40.10		

λ Cygni.

R. A., 20^h $43^m.5$ Dec., 36° 7′

1903.530	16.6	105 6	85.58	V	
.532	16.7	104 53	84.70	X	
.543	18.4	105 5	85.12	X	Good.
1903.535	3 *n*	105 1	85.13		

56 Cygni.

R. A., 20^h $46^m.5$ Dec., 43° 41′

Date.	Sid. T.	p	s	Ocular.	Remarks.
	h	° ′	″		
1902.679	23.4	45 38	76.01	X	....10.5 *m.*
.699	23.0	45 33	75.95	X	....10.5
.707	19.2	45 52	77.40	X	11
.745	23.1	45 31	76.34	V	11
1902.707	4 *n*	45 38	76.42		

59 Cygni.

R. A.. 20^h $56^m.4$ Dec., 47° 8′

1903.530	17.4	351 33	20 21	V	
.532	16.5	352 8	20.23	X	
.543	18.2	352 11	20.20	X	
1903.535	3 *n*	351 57	20.21		

61 Cygni. A. B.

R. A., 21^h $2^m.2$ Dec., 38° 13′

1902.688	22.8	125 41	22.22	X	
1907.587	17.7	128 16	22.85	X	
.593	16.9	128 5	22.98	X	
1902.688	1 *n*	125 41	22.22		
1907.590	2 *n*	128 10	22.92		

61 Cygni. B. C.

R. A., 21h 2m.2 Dec., 38° 13′

Date.	Sid. T.	p	s	Ocular.	Remarks.
	h	° ′	″		
1902.688	22.6	197 34	277.44	X	
.745	23.4	197 28	277.62	X	
.759	23.3	197 33	278.12	X	
1907.584	17.1	196 8	305.95	X	
.587	17.5	196 12	306.12	X	
.593	17.1	196 9	306.21	X	
1902.731	3 *n*	197 31.7	277.73		B, C.
1907.588	3 *n*	196 9.7	306.09		A, C.

Σ 2760.

R, A., 21h 2m.7 Dec., 33° 44′

1903.721	23.3	226.6	6.06	V	
.723	23.2	226.3	6.05	V	
.726	19.5	225.9	6.13	V	
1903.723	3 *n*	226.3	6.08		

δ Equulei.

R. A., 21h 9m.6 Dec., 9° 36′

1902.688	21.5	17 41	43.72	X	
.699	22.3	17 51	43.62	X	
.745	0.5	17 3	43.89	III	
1902.711	3 *n*	17 32	43.74		

τ Cygni. AB, C.

R. A., $21^h\ 10^m.8$ Dec., 37° 37′

Date.	Sid. T.	p	s	Ocular.	Remarks.
	h	° ′	″		
1903.105	3.2	211 9	160.40	X	
.726	19.8	210 45	160.14	V	
.729	19.6	210 52	159.91	X	
1903.520	3 *n*	210 55.3	160.15		

1 Pegasi.

R. A., $21^h\ 17^m.5$ Dec., 19° 23′

1903.527	18.1	311 26	35.99	X	
.530	18.0	310 54	36.48	V	
.532	18.1	310 56	36.22	X	
1903.530	3 *n*	311 5	36.23		

μ Cygni. A. B.

R. A., $21^h\ 39^m.7$ Dec., 28° 17′

1903.726	20.2	128.1	2.38	VI	Blurred.

μ Cygni. A. C.

R. A., $21^h\ 39^m.7$ Dec., 28° 17′

1903.723	22.2	54 23	206.42	V	
.726	20.1	54 21	206.56	V	
.729	19.9	54 19	206.27	X	
1903.726	3 *n*	54 21.0	206.42		

κ Pegasi.

R. A., 21h 40m.1 Dec., 25° 11′

Date.	Sid. T.	p	s	Ocular.	Remarks.
	h	° ′	″		
1903.530	17.7	298 53	12.32	V	....11 *m.*
.532	17.6	297 55	12.58	X	10
.543	18.7	299 1	12.52	X	....10.5
1903.535	3 *n*	298 36	12.47		

100 Aquarii.

R. A., 21h 49m.4 Dec., —3° 46′

Date.	Sid. T.	p	s	Ocular.	Remarks.
1903.543	19.2	183 44	19.54	X	
.574	19.1	185 0	19.51	X	
1903.558	2 *n*	184 22	19.52		

15 Cephei. A. B.

R. A., 22h 0m.6 Dec., 59° 20′

Date.	Sid. T.	p	s	Ocular.	Remarks.
1903.141	5.8	296 53	10.50	X	....11.5 *m.*
.146	5.8	296 2	10.64	X	12
1903.144	2 *n*	296 28	10.57		

15 Cephei. A. C.

R. A., 22h 0m.6 Dec., 59° 20′

Date.	Sid. T.	p	s	Ocular.	Remarks.
1903.097	4.6	39 3	89.13	X	
.105	4.7	39 2	89.36	X	
.141	6.0	39 3	89.25	X	
1903.114	3 *n*	39 3	89.25		

ι Pegasi.

R. A., 22h 2m.3 Dec., 24° 51′

Date.	Sid. T.	p	s	Ocular.	Remarks.
	h	° ′	″		
1902.688	23.4	219 37	103.14	X	....10 *m.*
.745	23.8	219 45	102.92	X	....10.5
.759	23.7	219 21	102.06	X	....11.5 Difficult.
1902.731	3 *n*	219 34.3	102.71		

Σ 2877.

R. A., 22h 9m.5 Dec., 16° 42′

1903.723	20.9	2.3	12.12	V	
.726	20.4	3.6	11.91	V	
.729	20.2	3.6	12.00	V	
1903.726	3 *n*	3.1	12.01		

33 Pegasi. A. C.

R. A., 22h 18m.8 Dec., 20° 21′

1903.723	21.1	324 16	66.98	V	
.726	20.7	323 59	67.44	V	
.729	20.4	324 13	67.07	V	
1903.726	3 *n*	324 9	67.16		

10 Lacertae.

R. A., 22h 34m.8 Dec., 38° 32′

1903.097	4.1	48 53	61.23	X	
.105	4.2	48 47	61.29	X	
1903.101	2 *n*	48 50	61.26		

O Σ 477.

R. A., 22^h $39^m.1$ Dec., 45° 30′

Date.	Sid. T.	p	s	Ocular.	Remarks.
	h	°	″		
1903.574	19.5	204.3	4.77	X	....12 *m*. Difficult.
.667	20.6	206.8	4.66	X	12
.674	19.5	205.4	4.53	X	11
1906.617	18.6	209.0	4.99	V	....12.5 Difficult.
.649	17.8	207.4	4.51	V	
1907.676	19.4	213.8	4.85	X	....11.5
1903.638	3 *n*	205.50	4.65		
1906.633	2 *n*	208.20	4.75		
1907.676	1 *n*	213.80	4.85		

Σ 2944. A. B.

R, A., 22^h $42^m.7$ Dec., —4° 45′

1903.726	21.1	255.7	3.23	V	
.770	22.3	257.1	3.14	V	
1903.748	2 *n*	256.4	3.18		

Σ 2944. A. C.

R. A., 22^h $42^m.7$ Dec., —4° 45′

1903.726	20.9	129 33	46.99	V	
.729	22.7	130 1	46.81	V	
.770	22.2	129 22	47.25	X	
1903.742	3 *n*	129 39	47.02		

ARG. 528.

R. A., 22h 46m.4 Dec., 13° 26′

Date.	Sid. T.	p		s	Ocular.	Remarks.
	h	°	′	″		
1902.712	21.9	338	16	199.24	X	
.745	0.6	338	8	198.77	X	
.764	23.1	338	20	199.19	X	
1902.740	3 *n*	338	14.7	199.07		

16 LACERTAE. A. B.

R. A., 22h 51m.8 Dec., 41° 4′

1903.143	5.3	344	34	27.42	X	....12 *m*, Difficult.
.146	6.1	345	29	27.32	X	12
1903.144	2 *n*	345	2	27.37		

16 LACERTAE. A. C.

R. A., 22h 51m.8 Dec., 41° 4′

1903.097	4.3	47	27	62.54	X	
.105	4.4	47	25	62.41	X	
.143	5.0	47	34	62.30	X	
1903.115	3 *n*	47	29	62.42		

O Σ 536.

R. A., 22h 53m.5 Dec., 8° 50′

1903.726	21.4	84	38	241.79	X	
.729	20.7	84	38	241.80	X	
.770	22.0	84	36	240.97	X	
1903.742	3 *n*	84	37.3	241.52		

β Pegasi.

R. A., 22^h $58^m.9$ Dec., 27° 32′

Date.	Sid. T.	p	s	Ocular.	Remarks.
	h	° ′	″		
1903.726	21.8	97 17	256.99	V	
.729	21.3	97 16	256.61	V	
.770	21.3	97 21	256.51	X	
1903.742	3 *n*	97 18.0	256.70		

57 Pegasi.

R. A., 23^h $3^m.6$ Dec., 8° 8′

1903.089	2.7	196 49	32.57	X	Daylight.
.097	3.8	197 12	32.75	X	
.105	3.9	196 44	32.51	X	
1903.097	3 *n*	196 55	32.61		

60 Pegasi.

R. A., 23^h $7^m.0$ Dec., 26° 18′

1903.726	22.2	294 7	231.89	V	
.729	21.6	294 11	231.87	V	
.770	21.0	294 7	231.82	X	
1903.742	3 *n*	294 8.3	231.86		

Arg. 540 = 5 H. Cassiopiae.

R. A., 23^h $8^m.5$ Dec., 56° 37′

1903.729	21.0	202 32	100.85	V	
.732	20.8	202 21	100.83	V	
.770	20.7	202 45	100.68	X	
1903.743	3 *n*	202 32.7	100.79		

ψ Aquarii.

R. A., $23^h\ 10^m.7$ Dec., $-9°\ 38'$

Date.	Sid. T.	p	s	Ocular.	Remarks.
	h	° ′	″		
1903.082	2.5	311 30	49.59	X	
.089	2.4	311 50	49.35	X	Daylight.
.097	2.8	311 2	49.36	X	Daylight.
1903.089	3 *n*	311 27	49.43		

λ Andromedae.

R. A., $23^h\ 32^m.6$ Dec., $45°\ 54'$

1902.712	21.4	89 39	218.53	X	
.830	21.8	89 35	218.03	X	
1902.771	2 *n*	89 37.0	218.28		

Σ 3041. A. C.

R. A., $23^h\ 42^m.6$ Dec., $16°\ 30'$

1903.726	22.5	351 3	64.44	V	
.729	21.8	351 29	64.22	V	
.770	22.6	351 36	67.66	....	A, B.
1903.742	3 *n*	351 25	65.99		A, ½ (B + C).

Σ 3041. B. C.

R. A., $23^h\ 42^m.6$ Dec., $16°\ 30'$

1903.726	22.7	177.1	3.27	V	
.729	22.0	176.3	3.36	V	
.770	22.7	178.2	3.43	V	
1903.742	3 *n*	177.2	3.35		

85 Pegasi.

R. A., $23^h\ 56^m.8$ Dec., 26° 33′

Date.	Sid. T.	p	s	Ocular.	Remarks.
	h	° ′	″		
1902.707	19.8	341 23	37.58	X	Difficult.
.712	22.4	341 26	37.61	X	
.764	0.1	341 6	37.74	V	
1902.728	3 *n*	341 18	37.64		

TABLE II.

Relative Motions.

Star	Obs'r	n	Epoch	1850.0 p_0	1850.0 s_0	O.—C. dA	O.—C. dD	Remarks
				° ′	″	″	″	
Arg. 559	$O\Sigma$	4	1853.82	244 18.6	143.16	+0.16	+0.16	
	$O\Sigma$	2	63.81	245 29.4	146.21	— .17	— .09	
1	$H\Sigma$	1	84.11	247 41.9	151.84	— .10	— .40	V=1875.27
	C	3	1903.74	249 57.4	157.09	+ .07	+ .14	

A = — 127.74 — 37.03 T 3.5   D = — 62.85 + 16.50 T 0.14

Star	Obs'r	n	Epoch	1850.0 p_0	1850.0 s_0	O.—C. dA	O.—C. dD	Remarks
α Andromedae	Σ	6	1836.38	266 52	64.96	+0.12	—0.25	
	$O\Sigma$	5	52.85	269 27	67.02	+0.16	+ .27	
	$O\Sigma$	6	56.06	269 37	67.72	— .11	.00	V=1865.64
2	$O\Sigma$	2	63.81	270 37	68.87	— .23	+ .07	
	$O\Sigma$	3	82.61	272 44	71.32	— .08	00	
	C	3	1902.13	274 45	73.90	+ .13	— .11	

A = — 66.79 — 13.43 T 6.0   D = — 1.32 + 14.50 T 0.26

Star	Obs'r	n	Epoch	1850.0 p_0	1850.0 s_0	O.—C. dA	O.—C. dD	Remarks
Σ 23	Σ	3	1828.52	361 14	13.67	+0.08	—0.11	
	Σ	3	35.73	359 43	12.94	— .04	.00	
	Σ	3	36.74	359 43	12.70	— .01	— .13	V=1863.85
	$O\Sigma$	2	46.24	357 54	12.01	— .13	+ .28	
	Δ	6	63.33	355 0	9.85	+ .03	+ .08	
	Δ	4	64.78	355 18	9.46	+ .16	— .13	
3	$O\Sigma$	2	67.88	353 3	9.22	— .08	— .05	
	$O\Sigma$	1	75.89	351 30	7.92	+ .12	— .45	
	Hl	2	75.98	351 42	8.70	+ .04	+ .35	
	Hl	5	85.46	346 40	7.43	— .11	+ .07	
	Hl	3	87.94	346 38	6.97	+ .07	— .09	
	C	3	1903.77	336 1	5.48	— .05	— .01	

A = — 0.47 — 3.18 T 11.5   D = + 11.28 — 11.64 T 0.60

Star	Obs'r	n	Epoch	1850.0 p_0	1850.0 s_0	O.—C. d A	O.—C. d D	Remarks.
				° ′	″	″	″	
σ 6	O Σ	1	1839.95	15 20	49.84	+0.51	—0.28	
	O Σ	1	51.99	15 33	53.78	— .03	+ .17	
4	O Σ	1	68.80	15 59	58.73	— .78	+ .20	V=1874.02
	O Σ	1	75.89	17 4	60.93	— .13	+ .06	
	C	3	1903.76	18 37	69.43	+ .21	— .07	

A = + 14.17 + 14.86 T D = + 51.10 + 27.38 T
3.0 0.17

Star	Obs'r	n	Epoch	p_0	s_0	d A	d D	Remarks.
42 Piscium	Σ	3	1829.50	344 2	31.68	— .04	+ .32	
	Σ	2	51.84	340 24	30.11	+ .07	— .37	
	Δ	5	64.57	338 5	29.70	— .06	— .36	V=1866.96
5	O Σ	2	65.90	338 21	30.09	+ .05	+ .15	
	Hl	4	86.92	334 53	29.47	+ .04	+ .19	
	C	3	1903.02	331 52	28.94	— .03	+ .05	

A = — 10.05 — 6.73 T D = + 28.84 — 6.35 T
6.0 0.33

Star	Obs'r	n	Epoch	p_0	s_0	d A	d D	Remarks.
Σ 32	Σ	2	1829.24	108 22	13.43	—0.10	+0.07	
49 Piscium	Σ	3	32.90	107 35	13.84	+ .05	+ .13	
	O Σ	2	51.84	106 51	15.48	+ .16	— .12	V=1858.74
6	Δ	5	64.78	106 36	16.28	— .10	— .24	
	O Σ	3	69.91	105 9	16.73	+ .02	+ .06	
	C	3	1903.76	103 12	19.35	00	+ .11	

A = + 14.52 + 8.05 T D = — 4.36 — 0.32 T
6.0 0.38

Star	Obs'r	n	Epoch	1850.0 p_0	s_0	O.—C. dA	dD	Remarks
				° ′	″	″	″	
Σ 42	Σ	4	1832.00	35 17	5.32	+0.12	—0.19	A, B.
	Σ	1	51.80	30 24	5.82	+ .09	+ .34	
	OΣ	2	54.32	27 33	5.47	— .31	+ .16	V=1863.11
7	OΣ	1	61.75	28 47	5.50	— .16	+ .07	
	Δ	4	68.68	32 20	5.51	+ .18	— .14	
	C	3	1903.76	27 41	5.67	+ .02	— .04	

A = + 2.86 — 0.47 T D = + 4.66 + 0.74 T
5.0 0.28

Star	Obs'r	n	Epoch	p_0	s_0	dA	dD	Remarks
Σ 42	OΣ	2	1854.32	184 48	52.75	—0.06	0.00	A. C.
	OΣ	1	61.75	186 29	49.88	+ .10	+ .01	
8	Renz	2	90.00	195 57	39.78	— .02	.00	V=1879.70
	C	3	1903.76	202 18	35.36	+ .02	.00	

A = — 3.58 — 18.34 T D = — 54.29 + 40.14 T
3.5 0.16

Star	Obs'r	n	Epoch	p_0	s_0	dA	dD	Remarks
54 Piscium	OΣ	1	1852.69	104 17.0	98.51	—0.51	+0.02	
9	OΣ	1	66.92	100 27.3	105.27	+ .71	— .03	
	C	3	1903.76	92 35.8	120.51	— .10	.00	V=1881.78

A = + 94.68 + 47.99 T D = — 25.33 + 36.94 T
2.0 0.10

Star	Obs'r	n	Epoch	p_0	s_0	dA	dD	Remarks
α Cassiopeiae	Σ	3	1820.68	278 32	59.09	+0.10	—0.43	
	OΣ	1	40.13	279 52	60.30	+ .20	+ .60	
10	OΣ	16	55.03	279 31	61.41	— .10	+ .03	V=1861.70
	OΣ	1	68.21	279 30	62.06	— .01	— .22	
	C	3	1903.09	280 13	64.09	+ .07	— .03	

A = — 60.18 — 5.58 T D = + 9.99 + 2.66 T
4.5 0.29

Star	Obs'r	n	Epoch	1850.0 p_0	1850.0 s_0	O.—C. d A	O.—C. d D	Remarks
				° ′	″	″	″	
μ Andromedae	O Σ	1	1854.70	41 42.1	277.49	—0.03	—0.23	
11	O Σ	1	82.65	41 11.0	275.39	+ .08	+ .54	
	C	3	1903.76	40 55.9	272.72	— .02	— .15	V=1886.22

A = + 185.20 — 12.10 T
2.0

D = + 207.53 — 2.48 T
0.08

Star	Obs'r	n	Epoch	p_0	s_0	d A	d D	Remarks
Σ 80	Σ	2	1831.53	299 32	18.14	+0.10	0.00	
	Σ	3	35.83	300 38	18.37	— .02	— .02	
	O Σ	2	42.84	302 27	18 69	— .17	— .07	V=1862.97
	O Σ	2	51.22	305 33	19.02	— .09	+ .10	
	Δ	6	63.83	309 14	19.36	+ .06	.00	
12	Δ	6	66.60	309 46	19.37	+ .11	— .14	
	O Σ	2	68.42	310 59	19.60	+ .14	+ .14	
	Hl	3	79.75	313 28	20.19	— .01	+ .01	
	Hl	3	85.93	314 49	20.57	— .10	— .01	
	C	3	1903.76	319 17	21.53	— .02	— .02	

A = — 14.90 + 2.57 T
10.0

D = + 12.22 + 10.25 T
0.48

Star	Obs'r	n	Epoch	p_0	s_0	d A	d D	Remarks
μ Cassiopeiae	O Σ	10	1855.15	164 6.4	239.26	+0.12	+0.15	
	O Σ	10	56.08	164 51.1	237.23	— .08	— .15	
13	O Σ	2	81.94	188 4.7	190.29	— .07	— .06	V=1873.81
	C	3	1902.08	211 25.0	183.83	+ .06	+ .03	

A = + 83.09 — 343.67 T
4.0

D = — 238.30 + 156.30 T
0.15

See V J S., V. 39, p. 197.

Star	Obs'r	*n*	Epoch	1850.0 p_0	1850.0 s_0	O.—C. dA	O.—C. dD	Remarks
				° ′	″	″	″	
σ^2 Piscium	OΣ	2	1842.95	292 55	55.57	+0.04	—0.05	
14	OΣ	1	68.80	293 20	56.06	— .13	+ .17	
	C	3	1903.10	293 34	56.13	+ .03	— .03	V=1872.18

$$A = -51.25 - 0.42\ T \qquad D = +21.78 + 1.31\ T$$
$$2.5 \qquad\qquad 0.18$$

80 Piscium	OΣ	1	1853.93	132 43.7	152.22	+0.31	—0.11	
	OΣ	1	68.76	131 40.3	153.84	— .28	+ .05	
15	OΣ	1	82.69	130 33.5	155.82	— .30	+ .19	V=1882.58
	C	3	1903.77	128 58.1	159.59	+ .13	— .07	

$$A = +110.51 + 24.98\ T \qquad D = -103.42 + 5.82\ T$$
$$2.5 \qquad\qquad 0.10$$

ϑ Cassiopeiae	OΣ	2	1853.50	131 48.0	154.68	+0.01	—0.07	
16	OΣ	1	81.15	133 3.3	149.64	— .01	+ .31	
	C	3	1903.78	134 20.3	146.08	.00	— .09	V=1879.14

$$A = +116.07 - 21.54\ T \qquad D = -103.11 + 2.05\ T$$
$$2.5 \qquad\qquad 0.13$$

ψ Cassiopeiae	Σ	5	1831.04	103 12	30.92	+0.24	—0.12	A, ½ (B + C)
	Δ	4	67.28	106 30	28.31	— .01	+ .48	
17	Δ	3	68.12	106 59	27.88	— .43	— .13	V=1872.03
	Hl	2	89.92	109 21	26.89	— .09	— .25	
	C	4	1993.77	109 57	26.33	+ .32	+ .05	

$$A = +28.44 - 7.46\ T \qquad D = -7.48 - 2.89\ T$$
$$5.0 \qquad\qquad 0.30$$

Star	Obs'r	n	Epoch	1850.0		O.—C.		Remarks
				p_0	s_0	d A	d D	
				° ′	″	″	″	
Σ 125	Σ	3	1831.20	36 13	16.77	+0.06	+0.10	
	Σ	3	35.25	30 8	17.05	— .08	— .11	
	Σ	4	36.62	27 23	17.21	— .33	— .05	V=1853.91
18	*O* Σ	2	43.90	19 7	18.98	+ .15	+ .07	
	O Σ	2	52.91	8 48	21.35	— .12	+ .08	
	Δ	10	63.83	0 55	24.80	+ .27	— .03	
	C	3	1903.70	342 54	40.58	— .20	+ .02	

A = + 4.26 — 29.77 T D = + 20.00 + 34.95 T
8.0 0.39

μ Piscium	*O* Σ	1	1853.93	303 45.5	170.01	—0.05	—0.12	
19	*H* Σ	1	83.81	302 35.0	176.73	+ .14	+ .32	
	C	3	1903.70	301 36.4	181.14	— .04	— .09	V=1886.28

A = — 140.26 — 26.01 T D = + 94.56 + 0.86 T
2.0 0.08

Σ 132 *seq*	Σ	2	1829.87	5 28	24.25	+0.02	—0.22	
	O Σ	2	51.81	359 9	28.88	— .03	+ .22	
	Δ	6	64.47	356 11	31.24	— .13	+ .02	V=1864.50
20	*O* Σ	1	68.91	355 42	32.42	+ .06	+ .31	
	O Σ	1	76.12	354 32	33.50	+ .18	— .09	
	C	3	1903.81	350 8	39.31	+ .02	— .13	

A = — 0.18 — 12.25 T D = + 28.30 + 19.64 T
5.0 0.31

υ Andromedae	*O* Σ	1	1853.76	277 10.4	286.91	+0.24	—0.53	
21	*O* Σ	1	82.61	279 53.7	283.90	— .58	+1.26	
	C	3	1903.81	281 23.8	280.19	+ .17	—0.16	V=1886.00

A = — 285.62 + 20.14 T D = + 34.79 + 38.70 T
2.0 0.08

Star	Obs'r	n	Epoch	1850.0 p_0	1850.0 s_0	O.—C. dA	O.—C. dD	Remarks
				° ′	″	″	″	
Σ 142	Σ	3	1829.52	310 59	26.65	—0.01	—0.05	
	Σ	2	35.90	312 41	25.36	+ .05	— .05	
	Σ	2	36.86	313 8	25.30	+ .02	+ .10	V=1855.66
	OΣ	3	42.46	314 21	24.25	— .11	.00	
22	Σ	1	51.88	317 24	22.54	— .12	+ .06	
	Δ	7	64.01	321 54	20.18	.00	— .11	
	OΣ	2	68.86	324 45	19.47	+ .14	+ .11	
	OΣ	1	75.88	328 2	18.15	+ .20	— .08	
	O	3	1903.81	345 28	14.71	— .09	.00	

A = — 15.56 + 22.22 T D = + 16.62 — 4.42 T
8.0 0.44

Star	Obs'r	n	Epoch	p_0	s_0	dA	dD	Remarks
107 Piscium	OΣ	1	1852.74	328 5	65.22	—0.27	—0.08	
23	OΣ	1	75.90	339 24	75.86	+ .48	+ .16	
	C	3	1903.81	348 6	91.35	— .11	— .03	V=1884.06

A = — 35.04 + 30.30 T D = + 53.59 + 66.55 T
2.0 0.09

Star	Obs'r	n	Epoch	p_0	s_0	dA	dD	Remarks
6 h Persei	OΣ	3	1853.71	75 48.0	146.58	—0.14	+0.01	
24	OΣ	2	77.14	73 31.2	139.98	+ .27	— .01	
	C	3	1902.08	70 42.1	132.44	— .14	+ .02	V=1877.64

A = + 143.56 — 35.42 T D = + 35.35 + 16.16 T
3.0 0.12

Star	Obs'r	n	Epoch	p_0	s_0	dA	dD	Remarks
o Ceti	OΣ	2	1851.95	85 9.1	115.43	—0.11	+0.19	
	OΣ	1	65.87	83 54.7	116.03	+ .47	— .32	
25	OΣ	2	76.44	82 44.9	115.80	+ .06	— .31	V=1876.52
	Doub	2	79.91	82 3.2	115.63	— .21	+ .30	
	C	4	1903.10	79 41.4	116.50	+ .02	+ .08	

A = + 114.96 — 0.60 T D = + 9.14 + 21.91 T
4.5 0.14

Star	Obs'r	n	Epoch	1850.0 p_0	1850.0 s_0	O.—C. d A	O.—C. d D	Remarks
				° ′	″	″	″	
ϑ Persei	OΣ	3	1852.83	210 48	65.97	0.00	+0.04	
26	OΣ	1	69.95	215 30	68.03	— .01	— .11	
	C	3	1902.08	223 42	72.75	+ .01	+ .01	V=1875.95

A = — 32.86 — 33.22 T D = — 56.94 + 8.33 T
2.5 0.13

Star	Obs'r	n	Epoch	p_0	s_0	d A	d D	Remarks
Σ 307	Σ	—	1821.34	300 29	28.12	−0.13	—0.03	
η Persei	Σ	3	31.20	300 30	28.04	+ .07	— .05	
27	Δ	4	67.93	300 26	28.39	— .10	+ .15	V=1860.91
	C	3	1903.09	299 59	28.23	+ .05	— .08	

A = — 24.30 — 0.36 T D = + 14.26 — 0.15 T
3.5 0.35

Star	Obs'r	n	Epoch	p_0	s_0	d A	d D	Remarks
41 Arietis	Σ	1	1852.15	255 4	18.75	+0.69	+0.14	A B
	Δ	3	66.53	260 30	20.58	— .32	— .03	
28	Δ	2	77.82	263 8	21.20	— .14	— .41	V=1878.43
	β	2	79.41	265 44	21.18	— .08	+ .36	
	C	2	1903.10	271 47	22.80	+ .21	+ .02	

A = — 18.62 — 8.22 T D = — 5.19 + 11.06 T
4.5 0.11

Star	Obs'r	n	Epoch	p_0	s_0	d A	d D	Remarks
41 Arietis	Σ	1	1852.15	199 7	35.48	+0.20	+0.19	A C
	Δ	2	72.79	202 56	34.46	— .22	— .07	
29	β	2	78.41	203 23	34.04	+ .08	— .12	
	C	2	1903.10	207 58	32.38	+ .05	+ .09	V=1880.11

A = — 11.68 — 6.72 T D = — 33.93 + 9.89 T
3.5 0.10

Star	Obs'r	n	Epoch	1850.0 p_0		1850.0 s_0	O.—C. dA	O.—C. dD	Remarks
				°	′	″	″	″	
41 Arietis	Σ	2	1852.14	228	42.5	127.17	—0.02	+0.05	A D
	Δ	1	77.78	229	45.3	126.91	— .11	— .71	
30	Doub	3	79.80	230	5.7	126.25	— .07	+ .09	V=1878.64
	β	2	79.93	230	3.7	125.95	+ .23	+ .29	
	C	2	1903.10	231	14.0	125.54	— .03	+ .03	

A = — 95.42 — 4.58 T   D = — 84.20 + 10.48 T
4.5   0.13

Star	Obs'r	n	Epoch	p_0		s_0	dA	dD	Remarks
16 Persei	OΣ	1	1857.41	144	9.8	262.96	—0.12	—0.16	
31	OΣ	1	81.16	144	29.9	257.62	+ .27	+ .35	
	C	3	1903.94	145	5.0	252.86	— .06	— .09	V=1886.61

A = + 155.56 — 19.97 T   D = — 213.94 + 12.39 T
2.0   0.07

Star	Obs'r	n	Epoch	p_0		s_0	dA	dD	Remarks
κ Ceti	OΣ	3	1853.26	153	12.9	271.57	—0.01	+0.10	
32	HΣ	2	84.10	155	14.2	270.13	+ .03	— .27	
	C	3	1904.18	156	31.2	268.73	— .02	+ .16	V=1880.51

A = + 123.37 — 30.05 T   D = — 242.27 — 8.07 T
3.0   0.13

Star	Obs'r	n	Epoch	p_0		s_0	dA	dD	Remarks
Σ 412	Σ	4	1830.92	63	7	22.41	+0.18	−0.01	½ (A + B), C
7 Tauri	OΣ	1	51.81	61	24	22.16	— .11	+ .08	
	Δ	4	64.30	61	8	22.03	— .11	— .11	V=1871.41
	OΣ	3	71.73	60	8	22.05	— .21	+ .09	
33	Hl	2	78.06	60	12	22.29	+ .09	+ .08	
	Hl	2	89.06	59	40	22.14	— .01	— .02	
	C	3	1904.18	59	7	22.25	+ .15	+ .05	

A = + 19.58 — 1.17 T   D = + 10.49 + 1.80 T
6.5   0.33

Star	Obs'r	n	Epoch	1850.0 p_0		1850.0 s_0	O.—C. d A	O.—C. d D	Remarks
				°	′	″	″	″	
Σ 431	Σ	3	1830.17	237	18	20.01	+0.06	−0.18	
o Persei	Δ	3	66.14	238	19	19.98	− .10	+ .24	
34	β	1	77.88	237	51	19.98	− .01	+ .20	V=1868.10
	C	2	1903.11	236	30	20.20	+ .05	− .21	

$$A = -16.90 - 0.01\,T \qquad D = -10.71 - 0.44\,T$$
3.5 0.27

Star	Obs'r	n	Epoch	p_0		s_0	d A	d D	Remarks
43 Persei	Σ	2	1852.14	29	42	75 43	+0.12	+0.13	
35	O Σ	2	74.00	29	29	74.92	− .21	− .22	
	C	3	1903.16	29	23	75.26	+ .09	+ .10	V=1876.43

$$A = +37.29 - 0.86\,T \qquad D = +65.40 + 0.16\,T$$
1.5 0.13

Star	Obs'r	n	Epoch	p_0		s_0	d A	d D	Remarks
39 Tauri	O Σ	3	1853.50	5	20.5	166.50	−0.03	−0.04	
	O Σ	2	68.65	4	30.9	167.49	− .08	+ .26	
36	Doub	3	79.92	4	1.2	167.49	+ .17	− .29	V=1876.56
	C	3	1904.18	2	39.9	169.04	− .07	+ .08	

$$A = +16.05 - 15.00\,T \qquad D = +165.62 + 5.84\,T$$
4.0 0.14

Star	Obs'r	n	Epoch	p_0		s_0	d A	d D	Remarks
A′ Tauri	O Σ	1	1853.83	186	52.6	138.70	+0.76	+0.01	
37	Doub	4	80.73	188	32.8	138.33	− .84	− .02	
	C	3	1903.13	188	52.5	137.62	+ .46	+ .01	V=1884.31

$$A = -17.04 - 8.76\,T \qquad D = -137.84 + 3.51\,T$$
2.5 0.08

Star	Obs'r	n	Epoch	1850.0		O.—C.		Remarks
				p_0	s_0	d A	d D	
				°	″	′	′	
O Σ 531	*O* Σ	4	1851.68	145.5	3.32	−0.09	+0.18	A B
	O Σ	3	54.04	147.1	3.37	− .13	+ .01	
	O Σ	2	58.18	147.0	3.52	− .01	− .26	V=1878.65
	O Σ	1	70.25	138.5	2.95	+ .14	+ .07	
	O Σ	4	77.71	135.2	2.79	+ .22	+ .04	
38	*Δ*	9	77.05	139.3	2.80	+ .06	− .07	
	Hl	3	80.02	137.3	2.64	+ .13	+ .02	
	Hl	3	89.10	132.9	2.32	+ ,04	+ .07	
	A	2	99.12	130.6	2.02	− .05	.00	
	Hu	3	99.68	129.5	2.01	− .02	+ .01	
	C	2	1904.20	129.3	1.82	− .12	− .01	

A = + 1.99 − 0.85 T   D = − 2.97 + 3.39 T

10.5   0.34

O Σ 531	*O* Σ	5	1852.89	205 29.6	239.69	−0.13	+0.02	A C
39	*O* Σ	2	58.20	205 45.7	239.03	+ .14	− .03	
	C	3	1904.21	208 43.9	234.21	− .02	.00	V=1871.77

A = − 102.49 − 18.59 T   D = − 217.01 + 21.41 T

3.0   0.16

40 Eridani	*O* Σ	1	1850.98	278 42	99.43	−0.54	+0.95	A D
	Win	1	64.84	312 25	89.45	+1.35	−1.04	
40	*O* Σ	1	65.87	314 35	92.19	−0.55	−0.17	V=1879.20
	Flam	2	77.12	339 4	109.9	+1.13	−0.57	p = o
	C	3	1907.14	7 2.1	207.39	−0.07	+0.16	

A = − 99.89 + 219.40 T   D = + 10.73 + 341.15 T

2.5   0.14

Star	Obs'r	n	Epoch	1850.0		O.—C.		Remarks
				p_0	s_0	d A	d D	
				° ′	″	″	″	
40 Eridani	Σ	2	1825.05	107 36	85.32	+0.60	+0.37	A B
	Σ	2	36.04	107 20	83.48	— .20	— .44	
	O Σ	4	51.22	106 9	82.05	+ .19	— .03	V=1876.34
	O Σ	3	53.91	106 4	81.75	+ .83	— .04	
	O Σ	3	56.47	105 50	81.86	+ .06	+ .10	
	Δ	8	63.47	105 41	82.12	— .46	— .07	
	O Σ	4	65.37	105 36	81.44	+ .09	+ .17	
	O Σ	3	71.79	105 47	81.70	— .05	+ .47	
	O Σ	2	77.12	105 42	81.55	+ .09	— .09	
	Hl	2	79.18	105 25	81.90	— .34	— .33	
	β	2	79.56	106 9	81.10	+ .72	+ .46	
41	Hl	3	82.12	105 32	82.04	— .37	— .09	
	H Σ	2	84.10	105 23	81.11	+ .49	— .34	
	Hl	3	86.12	105 20	81.98	— .33	+ .01	
	Hl	3	88.10	105 28	81.99	— .27	— .22	
	Hl	4	89.12	105 21	82.01	— .29	+ .02	
	Hl	4	91.05	105 16	82.10	— .25	+ .12	
	A	2	99.11	105 9	82.52	— .53	— .16	
	Doo	3	1901.99	105 28	81.59	+ .60	— .22	
	C	3	02.05	105 18	82.03	+ .10	— .09	
	β	3	04.70	105 2	82.12	— .02	+ .32	
	C	1	1907.13	105 12	82.71	— .35	— .02	

$$A = +79.80 + 0.62\,T \qquad\qquad D = -24.33 + 5.99\,T$$
$$21.5 \qquad\qquad\qquad\qquad 0.68$$

Star	Obs'r	n	Epoch	p_0	s_0	d A	d D	Remarks
40 Eridani	O Σ	1	1850.98	196 59.5	128.59	+0.18	—0.22	A E
	Win	1	64.84	184 58	76.10	+ .42	— .41	
42	O Σ	1	65.87	184 44	71.94	—1.22	+ .27	V=1881.47
	Hl	1	79.18	135 57	36.33	+ .42	+0.30	

Star	Obs'r	n	Epoch	1850.0		O.—C.		Remarks
				p_0	s_0	d A	d D	
				° ′	″	″	″	
40 Eridani—Con.	Hl	2	1882.12	117 25	35.34	+0.02	+0.09	
	Hl	3	86.12	93 52	49.46	+ .13	— .03	
	Hl	3	88.10	84 33	44.94	+ .12	+ .21	
	C	4	1902.05	55 40	91.28	— .20	— .27	

A = — 39.93 + 221.92 T   D = — 126.12 + 341.70 T

6.0   0.12

φ Tauri	Σ	2	1851.94	244 2	54.37	+0.25	+0 20	
	O Σ	1	65.92	244 54	54.55	— .10	— .46	
43	Doub	3	79.40	245 21	53.85	— .39	— .16	V=1879.88
	Hl	2	90.96	246 20	53.18	— .12	— .02	
	C	3	1904.18	247 35	52.27	+ .30	+ .21	Orbital motion

A = — 24.19 = 7.23 T   D = — 49.11 + 1.06 T

4.5   0.16

α Tauri	Σ	2	1836.06	36 5	109.04	—0.08	—0.09	
	O Σ	9	53.82	35 19.6	111.61	— .14	+ .18	
	O Σ	9	55.36	35 24.5	111.78	+ .04	— .01	V=1864.79
44	*O* Σ	6	56.95	35 25.3	112.11	+ .24	+ .02	
	H Σ	3	84.16	34 21.1	115.41	— .20	— .15	
	C	3	1902.40	33 50.3	118.22	+ .12	+ .03	

A = + 64.59 + 2.13 T   D = + 90.31 + 14.95 T

6.0   0.29

1 Orionis	*O* Σ	2	1852.87	128 4.4	112.50	—0.18	0.00	
	O Σ	1	69.10	130 34.8	107.10	+ .25	+ .13	
45	*H* Σ	2	84.15	133 34.4	102.23	+ .05	— .25	V=1877.07
	C	3	1902.16	137 10.5	96.25	— .12	+ .12	

A = + 90.08 — 46.96 T   D = — 69.29 — 2.74 T

3.5   0.13

Star	Obs'r	n	Epoch	1850.0 p_0	1850.0 s_0	O.—C. d A	O.—C. d D	Remarks
				° ′	″	″	″	
13 Orionis	$O\Sigma$	2	1852.90	255 10.8	128.20	+0.19	+0.12	A B
46	$O\Sigma$	2	76.14	258 52.7	126.50	— .36	— .22	
	C	3	1904.21	263 43.6	123.92	+ .16	+ .12	V=1877.75

A = — 124.16 + 1.53 T
3.0

D = — 34.00 + 37.54 T
0.13

Star	Obs'r	n	Epoch	p_0	s_0	d A	d D	Remarks
13 Orionis	$O\Sigma$	1	1851.88	See Obs.	Poulk.	....	+0.12	A C
47	$O\Sigma$	1	79.16	Vol. IX,	p. 65.	....	— .17	
	C	3	1904.21	268 3.0	402.72	....	+ .04	V=1884.86

D = — 37.05 + 39.17 T
0.10

Star	Obs'r	n	Epoch	p_0	s_0	d A	d D	Remarks
Σ 634	Σ	3	1832.10	348 43	34.53	+0.09	—0.19	
19 H. Camelop.	Σ	3	36.20	349 19	33.55	.00	+ .17	
	Δ	3	58.33	353 7	26.24	— .30	+ .01	V=1866.55
	Δ	5	63.15	355 2	24.63	— .03	— .03	
	Δ	5	66.12	356 17	23.65	+ .10	— .07	
48	$O\Sigma$	3	70.65	357 56	22.42	+ .14	+ .13	
	Hl	2	79.31	1 0	19.75	— .03	+ .12	
	Hl	2	90.98	7 40	16.04	— .02	— .18	
	C	2	1902.11	17 24	13.28	+ .11	— .01	

A = — 4.11 + 15.29 T
9.0

D = + 28.58 — 30.54 T
0.42

Star	Obs'r	n	Epoch	p_0	s_0	d A	d D	Remarks
α Aurigae	$O\Sigma$	3	1851.53	147 21.9	169.54	+0.20	—0.01	
	$O\Sigma$	14	53.57	147 20.7	168.43	— .14	— .06	
	$O\Sigma$	13	54.89	147 12.9	168.03	+ .05	+ .10	V=1865.54
49	$O\Sigma$	1	68.25	146 28.8	163.06	+ .26	— .11	
	$H\Sigma$	2	84.09	145 45.7	156.59	— .33	— .20	
	C	3	1904.24	144 17.0	148.78	+ .17	+ .10	

A = + 91.36 — 8.63 T
7.5

D = — 143.39 + 41.48 T
0.25

Star	Obs'r	n	Epoch	1850.0 p_0		1850.0 s_0	O.–C. d A	O.–C. d D	Remarks
				°	′	″	″	″	
λ Aurigae	Σ	3	1836.21	29	8.2	103.60	−0.06	−0.04	
50	Δ	5	64.51	18	6.0	114.63	+ .09	+ .05	
	C	3	1903.16	6	23.4	134.82	− .03	− .02	V=1867.96

A = + 43.21 − 52.97 T D = + 99.47 + 64.94 T
3.0 0.23

111 Tauri	OΣ	1	1839.24	271	32	65.72	+0.03	−0.08	
	Σ	1	52.12	271	23	68.43	+ .30	− .17	
51	OΣ	1	75.20	270	55	74.81	− .75	− .09	V=1875.85
		2	79.07	270	32	74.86	+ .09	+ .36	
	C	3	1903.13	270	38	80.39	+ .20	− .20	

A = − 68.23 − 23.14 T D = − 1.52 + 1.59 T
3.5 0.17

ϑ^{0} Orionis	Σ	7	1832.33	353	42	3.86	+0.03	−0.13	A. E.
	OΣ	4	59.62	353	37	4.25	+ .05	+ .24	
	Δ	5	67.04	354	11	4.02	+ .16	+ .02	V=1869.37
52	OΣ	2	70.70	350	32	3.88	− .10	− .15	
	β	3	77.91	350	27	3.92	− .08	− .11	
	OΣ	1	78.19	350	44	4.19	− .12	+ .15	
	C	3	1904.21	351	4	3.98	+ .02	− .06	

A = − 0.50 − 0.27 T D = + 3.97 + 0.03 T
6.5 0.28

^{1} Orionis	OΣ	2	1846.66	123	25	3.35	−0.12	+0.38	C. F.
	OΣ	3	57.28	130	56	4.08	+ .05	− .39	
53	OΣ	2	61.22	123	23	3.70	+ .02	+ .12	V=1869.88
	Δ	5	67.04	119	41	3.74	+ .01	+ .25	
	OΣ	2	70.70	125	59	3.96	+ .07	− .19	

Star	Obs'r	n	Epoch	1850.0 p_0	1850.0 s_0	O.—C. d A	O.—C. d D	Remarks
				° ′	″	″	″	
ϑ^1 Orionis—Con.	β	3	1877.92	119 27	3.92	+0.16	+0.17	
	OΣ	1	78.19	127 20	3.88	— .09	— .22	
	C	3	1904.21	119 46	3.97	— .07	+ .02	

A = + 2.95 + 1.05 T
7.5

D = — 2.20 + 0.40 T
0.21

Star	Obs'r	n	Epoch	p_0	s_0	d A	d D	Remarks
South 503	South	1	1825.1	134 14.5	39.94	+0.47	—0.43	p = o
	Δ	9	75.01	118 35.5	7.29	— .09	— .04	
	OΣ	2	77.64	112 5.7	5.73	— .04	+ .03	V=1887.57
54	Hl	2	88.19	16 38.0	2.94	+ .07	— .07	
	C	9	90.16	359 40.4	3.88	+ .06	+ .05	
	Hl	4	90.17	0 6.4	3.92	+ .10	+ .08	
	C	3	1904.25	329 9.4	12.32	— .12	— .03	

A = + 17.34 — 43.40 T
6.0

D = — 15.46 + 48.07 T
0.06

Star	Obs'r	n	Epoch	p_0	s_0	d A	d D	Remarks
ϑ Aurigae	Σ	1	1852.12	290 51	43.20	+0.01	—0.30	A C
	OΣ	1	70.25	292 6	45.04	— .29	+ .04	
55	Δ	2	76.24	292 24	45.18	+ .05	— .10	V=1880.01
	β	3	79.41	293 6	45.52	+ .12	+ .33	
	C	3	1903.22	293 41	47.44	— .04	— .07	

A = — 40.26 — 5.91 T
4.0

D = + 15.54 + 6.74 T
0.10

Star	Obs'r	n	Epoch	p_0	s_0	d A	d D	Remarks
ϑ Aurigae	OΣ	1	1840.16	350 47.7	123.34	+0.28	—0.17	A D.
	Σ	1	52.12	350 17.2	124.85	— .18	+ .22	
56	β	1	80.05	349 23.5	127.14	— .72	— .03	V=1875.75
	C	3	1903.22	349 18.8	129.02	+ .27	— .01	

A = — 20.74 — 6.48 T
2.5

D = + 122.68 + 7.73 T
0.17

Star	Obs'r	n	Epoch	1850.0 p_0	1850.0 s_0	O.—C. dA	O.—C. dD	Remarks
				° ′	″	″	″	
15 Geminorum	$O\Sigma$	1	1841.23	205 53	32.11	−0.06	−0.14	
57	$O\Sigma$	2	78.22	204 42	30.18	+ .06	+ .16	
	C	3	1904.27	203 47	29.34	− .04	− .10	V=1881.25

$$A = -13.66 + 3.45\,T \qquad D = -28.47 + 3.18\,T$$
2.5 0.13

Star	Obs'r	n	Epoch	p_0	s_0	dA	dD	Remarks
6 Lyncis	$O\Sigma$	3	1851.61	121 40.7	188.17	−0.04	+0.01	
	$O\Sigma$	1	61.35	120 46.9	186.56	− .01	+ .03	
58	$H\Sigma$	2	84.25	118 37.9	183.08	+ .11	− .07	V=1877.37
	C	3	1904.25	116 40.4	179.91	− .07	+ .05	

$$A = +160.15 + 1.25\,T \qquad D = -99.39 + 34.25\,T$$
3.5 0.16

Star	Obs'r	n	Epoch	p_0	s_0	dA	dD	Remarks
8 Lyncis	$O\Sigma$	2	1850.80	84 58.0	143.57	−0.19	−0.05	A B
	$O\Sigma$	1	61.35	83 50.1	146.46	+ .41	+ .05	
59	$H\Sigma$	2	84.25	81 31.1	151.27	+ .08	+ .08	V=1877.14
	C	3	1904.25	79 40.5	155.76	− .08	− .05	

$$A = +143.04 + 18.95\,T \qquad D = +12.42 + 28.66\,T$$
3.5 0.16

Star	Obs'r	n	Epoch	p_0	s_0	dA	dD	Remarks
$O\Sigma$ 154	$O\Sigma$	2	1846.76	136 40	30.40	−0.09	+0.05	
	$O\Sigma$	2	48.76	136 21	30.29	− .08	− .06	
	$O\Sigma$	1	61.26	133 25	29.28	+ .04	− .12	V=1875.03
	Δ	3	67.91	131 36	28.75	+ .14	− .09	
	$O\Sigma$	2	69.28	131 19	28.52	+ .03	− .03	
60	$O\Sigma$	1	77.25	129 6	27.65	− .08	+ .17	
	Δ	1	77.26	129 0	27.78	+ .05	+ .13	
	β	3	78.62	128 36	27.71	+ .09	+ .12	
	Hl	2	91.08	125 47	26.78	− .08	− .12	
	Hu	3	98.34	123 9	26.27	+ .05	+ .10	
	C	3	1904.27	121 52	25.85	− .11	− .08	

$$A = +21.02 + 1.93\,T \qquad D = -21.68 + 14.94\,T$$
9.5 0.33

Star	Obs'r	n	Epoch	1850.0 p_0	s_0	O.—C. dA	dD	Remarks.
				° ′	″	″	″	
56 Aurigae	$O\Sigma$	1	1841.23	18 14	53.71	−0.06	+0.06	
	Σ	2	51.94	18 56	51.92	− .14	− .04	
	$O\Sigma$	3	69.30	20 33	49.42	+ .16	+ .02	V=1872.54
61	Δ	6	75.88	21 9	48.24	+ .14	− .17	
	$O\Sigma$	4	78.04	21 1	48.14	− .03	+ .15	
	C	3	1903.19	23 16	44.24	− .11	+ .04	

A = + 16.97 + 1.16 T   D = + 49.49 − 16.72 T

5.5   0.19

Star	Obs'r	n	Epoch	p_0	s_0	dA	dD	Remarks.
15 Lyncis	$O\Sigma$	2	1850.79	167 14.6	206.66	−0.06	−0.11	
62	$O\Sigma$	2	66.30	167 4.7	204.46	+ .16	+ .15	
	C	4	1902.21	166 57.9	199.97	− .16	− .05	V=1873.10

A = + 45.69 − 0.84 T   D = − 201.55 + 13.00 T

3.0   0.14

Star	Obs'r	n	Epoch	p_0	s_0	dA	dD	Remarks.
$O\Sigma$ 165	$O\Sigma$	2	1847.22	130 22	3.96	+0.01	−0.10	
45 Geminorum	$O\Sigma$	2	56.74	115 55	3.40	+ .13	.00	
	$O\Sigma$	2	70.24	85 26	2.89	+ .05	+ .34	V=1883.65
	β	2	78.12	77 57	2.45	− .36	− .21	
	Hl	3	79.19	72 58	2.98	+ .10	+ .04	
	H. S. P.	3	80.56	72 56	2.73	− .12	− .17	
	Hl	3	87.06	60 30	3.31	+ .19	.00	
63	Hl	2	90.24	48 47	3.33	− .19	+ .24	
	β	3	90.96	52 46	3.25	− .06	− .07	
	$H\Sigma$	2	92.26	49 19	3.42	− .05	+ .06	
	Lewis	2	96.20	44 15	3.66	− .06	+ .04	
	Hu	3	99.13	43 6	4.11	+ .23	+ .12	
	Doo	5	99.88	39 49	4.13	+ .06	+ .19	
	C	2	1903.37	41 9	3.87	.00	− .39	

A = + 2.98 − 0.82 T   D = − 2.17 + 10.29 T

14.0   0.35

Star	Obs'r	n	Epoch	1850.0		O.—C.		Remarks
				p_0	s_0	d A	d D	
				° ′	″	″	″	
α Geminorum	Σ	7	1835.24			—0.19	—0.06	½ (A + B), C
Castor	*O* Σ	5	41.87			+ .18	— .07	
	O Σ	5	48.86	See Poulk.	Obs.,	+ .20	+ .12	V=1864.20
	O Σ	5	52.27	Vol. X,	p. 70.	— .09	+ .23	
	O Σ	5	60.07			+ .21	— .08	
64	*Δ*	5	62.87			— .28	— .15	
	Δ	5	69.06			— .03	— .14	
	O Σ	4	78.27	161 28	71.81	— .09	+ .13	
	Hl	4	91.26	161 38	71.81	+ .13	.00	
	C	3	1902.20	161 56	71.61	.00	— .01	

A = + 23.77 — 2.97 T   D = — 68.42 + 0.68 T
10.0   0.41

α Geminorum	*O* Σ	6	1851.92			+0.09	+0.20	A D
Castor	*O* Σ	2	56.50	See Obs.	Poulk.	— .14	— .10	V=1869.35
	O Σ	5	62.86	Vol. X,	p. 71.	— .20	— .37	
65	*O* Σ	3	73.26			— .20	+ .32	
	C	3	1902.20	163 58	72.98	+ .21	— .05	

A = — 148.80 + 17.05 T   D = — 155.89 — 7.11 T
5.0   0.16

Star	Obs'r	n	Epoch	1850.0		O.—C.		Remarks
				$\Delta\delta$	Orbital motion		d D	
				″	″		″	
α Can. Min.	*O* Σ	3	1852.14	+75.41	+0.33	....	+0.33	*O* Σ's * B
Procyon	*O* Σ	3	55.55	78.99	— .05	....	+ .08	
	O Σ	3	59.90	83.79	— .53	....	— .02	V=1877.34
66	*O* Σ	3	61.55	85.71	— .63	....	+ .13	
	O Σ	3	63.89	88.14	— .73	....	+ .08	

Star	Obs'r	n	Epoch	1850.0 $\Delta\delta$	1850.0 Orbital motion	O.—C.	O.—C. dD	Remarks
				°	″		″	
Procyon—Con.	O Σ	3	67.58	91.69	— .69	....	— .07	
	O Σ	4	69.72	93.80	— .55	....	— .02	
	O Σ	3	74.54	97.78	— .06	....	— .42	
	O Σ	3	78.20	101.49	+ .06	....	+ .01	
	O Σ	4	81.75	104.82	+ .64	....	+ .02	
	O Σ	4	85.21	107.89	+ .74	....	— .32	
	O Σ	3	87.90	110.71	+ .66	....	— .31	
	O Σ	3	89.81	113.00	+ .54	....	— .08	
	C	3	1902.21	127.25	— .68	....	+ .37	
	C	3	03.25	128.14	— .72	....	+ .17	
	C	3	04.27	129.31	— .74	....	+ .28	

D = + 73.24 + 101.44 T
16.0 0.44

Procyon	O Σ	3	1852.14	+30.61	+0.33	....	+0.06	O Σ's * C
α Can. Min.	O Σ	3	55.55	34.52	— .05	....	+ .14	
	O Σ	3	59.90	39.21	— .53	....	— .08	V=1877.34
	O Σ	3	61.55	40.95	— .63	....	— .11	
	O Σ	3	63.89	43.72	— .73	....	+ .18	
	O Σ	3	67.58	47.05	— .69	....	— .19	
	O Σ	4	69.72	49.42	— .55	....	+ .15	
	O Σ	3	74.54	53.59	— .06	....	— .09	
67	O Σ	3	78.20	56.90	+ .36	....	— .07	
	O Σ	4	81.75	60.35	+ .64	....	+ .06	
	O Σ	4	85.21	63.40	+ .74	....	— .31	
	O Σ	3	87.90	66.31	+ .66	....	— .20	
	O Σ	3	89.81	68.77	+ .54	....	+ .19	
	C	3	1902.21	82.49	— .68	....	+ .10	
	C	3	03.25	83.59	— .72	....	+ .10	
	C	3	04.27	84 58	— .74	....	+ .03	

D = + 28.70 + 101.55 T
16.0 0.44

Star	Obs'r	n	Epoch	1850.0		O.—C.		Remarks
				p_0	s_0	d A	d D	
				° ′	″	″	″	
Procyon	Lamont	*	1836.7	262 22	56.62	+2.22	+1.32	A. D.
α Can. Min.	Dawes	*	58.11	285 1	48.03	—1.30	— .90	
	O Σ	1	61.20	291 45	46.91	— .85	+ .65	V=1874.84
	Romb'g	2	63.21	294 50	45.83	— .46	+ .38	
	Lassell	*	64.17	295 56	44.63	+ .24	— .34	
	O Σ	1	64.26	296 20	46.61	—1.46	+ .72	
	O Σ	1	68.27	302 18	45.18	—1.05	+ .21	
	O Σ	1	70.27	305 6	43.54	— .04	— .74	
68	Newc.	1	74.00	311 41	44.62	— .48	+ .49	
	Ho.	*	76.03	311 52	42.03	+ .16	—2.96	
	Flam.	*	77.17	313 40	41.03	+1.05	—3.70	
	β	2	77.88	317 7	44.65	— .12	+ .05	
	β	2	79.20	318 42	44.83	— .15	— .20	
	β	2	80.18	322 27	44.77	+1.57	+ .72	
	β	3	82.20	323 26	45.40	+ .61	— .22	
	C	3	1902.21	345 35	60.80	— .53	+ .60	

A = — 49.96 + 68.27 T   D = + 4.81 + 101.16 T
10.0   0.17

Star	Obs'r	n	Epoch	p_0	s_0	d A	d D	Remarks
Pollux	Σ	3	1836.26	74 1.1	203.84	—0.17	—0.14	A, B.
Geminorum	O Σ	3	51.91	74 28.4	213.93	+ .29	+ .19	
69	H Σ	2	84.22	75 23.6	233.16	— .21	+ .02	V=1868.65
	C	3	1902.22	75 54.0	244.42	+ .08	— .05	

A = + 204.66 + 61.93 T   D = + 56.98 + 5.25 T
4.0   0.27

Star	Obs'r	n	Epoch	p_0	s_0	d A	d D	Remarks
Pollux	O Σ	3	1851.91	269 50	57.58	+0.17	+0.07	B. C.
β Geminorum	H Σ	1	84.16	269 16	57.99	— .45	— .25	
70	C	3	1902.22	269 20	57.42	+ .30	+ .13	V=1879.45

A = — 57.75 + 0.06 T   D = — 0.22 — 1.09 T
3.0   0.13

Star	Obs'r	n	Epoch	1850.0		O.—C.		Remarks
				p₀	s₀	d A	d D	
				° ′	″	″	″	
Pollux	*O* Σ	2	1850.72	See Obs.	Poulk.	+0.23	+0.22	A. D.
β Geminorum	*O* Σ	2	54.20	Vol X,	p. 77.	— .28	— .12	
71	*H* Σ	2	84.24			+ .08	— .36	V=1873.37
	C	2	1904.31	89 48.9	221.12	— .03	+ .23	

A = + 187.95 + 61.39 T D = — 1.26 + 3.20 T
4.0 0.20

Star	Obs'r	n	Epoch	p₀	s₀	d A	d D	Remarks
Pollux	*O* Σ	1	1851.13	319 16.8	187.51	+ .05	—0.01	A. E.
β Geminorum	*O* Σ	2	84.21	324 33.3	176.20	— .07	+ .01	
72	C	2	1904.31	328 7.9	170.08	+ .04	— .01	V=1885.63

A = — 123.10 + 61.24 T D = + 142.12 + 4.30 T
2.5 0.09

Star	Obs'r	n	Epoch	p₀	s₀	d A	d D	Remarks
π Geminorum	Σ	4	1831.25	211 50	22.61	—0.03	+0.04	
73	Δ	3	66.96	211 28	22.06	+ .07	— .09	
	C	3	1903 20	211 58	21.39	— .03	+ .04	V=1867.14

A = — 11.73 + 0.83 T D = — 18.97 + 1.47 T
3.0 0.26

Star	Obs'r	n	Epoch	p₀	s₀	d A	d D	Remarks
Σ 1190	Σ	3	1827.17	104 16	31.59	+0.02	+0.03	A. B.
29 Monocerotis	Δ	3	67.88	104 43	31.73	— .01	— .08	
74	C	3	1903.15	104 44	31.85	+ .01	+ .03	V=1866.07

A = + 30.66 + 0.24 T D = — 7.91 — 0.42 T
3.0 0.29

Star	Obs'r	n	Epoch	p₀	s₀	d A	d D	Remarks
Σ 1190	Σ	3	1831.24	244 32	67.08	– 0.01	+0.01	A. C.
29 Monocerotis	Δ	3	67.88	244 42	66.65	+ .03	— .03	
75	C	3	1903.19	244 58	66.26	— .01	+ .01	V=1867.44

A = — 60.41 + 0.71 T D = — 28.65 + 1.14 T
3.0 0.26

Star	Obs'r	n	Epoch	1850.0 p_0		1850.0 s_0	O.—C. dA	O.—C. dD	Remarks
				°	′	″	″	″	
Pi. vii 321	OΣ	1	1857.26	280	3.5	58.02	+0.14	−0.14	A. B.
Arg. 167	OΣ	1	81.28	298	32.3	52.81	− .28	+ .27	
76	C	2	1904.31	317	47.7	52.64	+ .07	− .08	V=1886.79

A = − 60.66 + 46.46 T   D = + 5.84 + 61.16 T
2.0   0.08

Pi. vii 321	OΣ	2	1850.72	83	56.2	192.98	−0.29	+0.16	A. C.
Arg. 167	OΣ	1	57.26	82	41.5	196.94	+ .28	+ .18	
77	OΣ	1	81.28	78	47.3	210.40	+ .77	−1.05	V=1874.77
	C	2	1904.31	74	46.7	223.38	− .23	+0.30	

A = + 191.93 + 43.92 T   D = + 19.71 + 71.14 T
3.0   0.16

Br. 1169	OΣ	1	1851.27	8	30	95.02	−0.05	−0.02	
B. A. C. 2751	Doub.	1	79.81	8	27	95.68	+ .08	+ .02	
78	C	3	1903.22	8	18	96.12	− .03	− .01	V=1884.38

A = + 14.09 − 0.38 T   D = + 93.96 + 2.22 T
2.0   0.09

Σ 1193	Σ	2	1831.81	85	29	44.39	+0.05	−0.12	
Camelop 176	Δ	3	67.36	85	14	43.90	− .08	+ .24	
79	C	3	1903.22	85	56	43.59	+ .04	− .11	V=1867.46

A = + 44.02 − 1.08 T   D = + 3.51 − 0.55 T
3.0   0.25

σ 294	OΣ	1	1841.23	166	2.4	74.69	0.00	−0.06	
	OΣ	2	73.29	168	1.4	76.08	− .26	+ .14	
80	Doub.	3	79.83	167	59.9	76.66	+ .31	− .10	V=1879.45
	C	2	1904.31	169	35.4	77.93	− .07	− .01	

A = + 17.49 − 6.15 T   D = − 73.04 − 6.64 T
3.5   0.14

Star	Obs'r	n	Epoch	1850.0			O.—C.		Remarks
				p_0		s_0	d A	d D	
				°	′	″	″	″	
δ Cancri	Lassell	1	1852.30	121	5	45.82	+0.36	−0.92	
	β	2	78.68	113	22	41.49	− .48	+ .41	
81	OΣ	2	79.74	112	29	41.81	+ .09	+ .62	V=1886.50
	C	3	1902.16	107	8	40.13	+ .07	− .21	
	β	3	02.50	107	10	40.17	+ .12	− .33	

$$A = +38.91 - 1.23\ T \qquad D = -23.24 + 22.29\ T$$
$$4.5 \qquad\qquad 0.12$$

Star	Obs'r	n	Epoch	p_0		s_0	d A	d D	Remarks
Σ 1263	Σ	7	1830.62	4	38.6	6.40	+0.20	+0.07	
	Σ	10	34.43	8	43.3	8.91	+ .01	+ .01	
	Σ	2	36.41	9	40.7	10.32	− .13	+ .08	V=1859.23
	OΣ	12	44.72	14	30.8	16.11	− .03	+ .09	
	OΣ	10	54.10	16	43.6	22.66	− .04	+ .07	
82	Δ	7	55.37	16	57.2	23.03	− .18	− .43	
	Δ	3	63.38	18	5.4	29.10	+ .02	− .03	
	OΣ	3	70.63	18	52.8	34.34	+ .17	+ .07	
	Hl	1	77.34	19	0.5	39.03	− .01	+ .11	
	Hl	2	89.24	19	27.3	47.30	− .13	+ .03	
	C	2	1904.31	20	9.3	57.96	+ .08	+ .01	

$$A = +5.47 + 26.56\ T \qquad D = +18.96 + 65.25\ T$$
$$10.5 \qquad\qquad 0.54$$

Star	Obs'r	n	Epoch	p_0		s_0	d A	d D	Remarks
10 Urs. Maj.	OΣ	2	1851.76	206	18.6	150.28	+0.10	−0.01	A. B.
	OΣ	1	81.29	203	17.7	139.59	− .00	+ .04	
83	HΣ	2	84.36	203	2.7	138.56	− .26	+ .06	V=1880.32
	C	2	1904.35	200	28.8	131.64	+ .16	− .06	

$$A = -67.42 + 39.00\ T \qquad D = -135.13 + 21.84\ T$$
$$3.5 \qquad\qquad 0.14$$

Star	Obs'r	n	Epoch	1850.0 p_0		s_0	O.—C. d A	d D	Remarks
				°	′	″	″	″	
10 Urs. Maj.	OΣ	1	1851.18	114	20.8	204.59	—0.42	—0.29	A. C.
84	OΣ	1	81.29	110	53.8	214.90	+1.04	+ .68	
	C	2	1904.35	109	4.3	221.53	—0.30	— .19	V=1885.30

A = + 186.36 + 42.88 T D = — 84.34 + 22.34 T
2.0 0.10

Star	Obs'r	n	Epoch	p_0		s_0	d A	d D	Remarks
75 Cancri	OΣ	2	1851.72	43	15.0	92.54	—0.01	—0.09	
	OΣ	1	61.27	42	32.8	95.83	+ .20	— .04	
85	Doub.	3	79.18	41	0.0	101.58	— .14	+ .18	V=1875.99
	C	2	1904.35	39	33.4	109.80	+ .06	— .05	

A = + 63.25 + 12.17 T D = + 66.96 + 32.70 T
3.5 0.15

Star	Obs'r	n	Epoch	p_0		s_0	d A	d D	Remarks
81 π Cancri	OΣ	1	1855 25	235	33.3	237.02	—0.27	+0.02	
	OΣ	1	70.28	233	35.7	232.48	— .04	— .34	
86	OΣ	1	82.34	232	6.1	227.91	+ .67	+ .48	V=1883.31
	C	3	1904.33	229	11.9	223.17	— .18	— .03	

A = — 198.11 + 54.03 T D = — 132.82 — 23.77 T
2.5 0.09

Star	Obs'r	n	Epoch	p_0		s_0	d A	d D	Remarks
ϑ Hydrae	OΣ	2	1853.76	172	10	62.16	+0.15	+0.09	
87	OΣ	2	71.26	174	43	56.14	— .23	— .14	
	C	3	1902.20	179	35	45.24	+ .09	+ .05	V=1875.74

A = + 8.97 — 16.67 T D = — 62.93 + 33.76 T
3.0 0.12

Star	Obs'r	n	Epoch	p_0		s_0	d A	d D	Remarks
σ 331	OΣ	1	1841.23	87	32.2	51.18	+0.09	+0.04	
	Doub.	3	81.24	84	15.2	56.62	— .05	— .15	
88	OΣ	1	81.26	83	49.2	56.57	— .14	+ .27	V=1882.30
	C	2	1904.42	82	24.1	60.09	+ .08	.00	

A = + 52.24 + 13.32 T D = + 2.97 + 9.15 T
3.0 0.13

Star	Obs'r	n	Epoch	1850.0 p_0	1850.0 s_0	O.—C. d A	O.—C. d D	Remarks
				° ′	″	″	″	
40 Lyncis	O Σ	1	1851.18	31 24.7	207.51	—0.43	+0.23	A, ½ (B + C)
	O Σ	1	61.27	32 11.8	208.53	+ .44	— .06	
89	O Σ	1	70.30	32 34.5	208.87	— .13	— .25	V=1878.78
	O Σ	1	81.29	33 14.6	210.32	+ .39	— .04	
	C	3	1904.33	34 18.2	212.34	— .13	+ .07	

A = + 108.33 + 21.13 T D = + 176.91 — 2.90 T
3.0 0.12

Star	Obs'r	n	Epoch	p_0	s_0	d A	d D	Remarks
41 Lyncis	O Σ	2	1840.27	162 19.7	85.31	—0.05	—0.03	A. B.
	O Σ	1	68.34	161 52.4	82.76	— .01	+ .13	
90	O Σ	2	78.34	161 45.4	82.12	+ .02	— .09	V=1875.07
	Doub.	3	80,55	161 37.7	81.76	+ .11	+ .08	
	C	2	1904.47	161 24.9	79.80	— .08	— .03	

A = + 25.88 — 0.69 T D = — 80.42 + 8.83 T
4.5 0.21

Star	Obs'r	n	Epoch	p_0	s_0	d A	d D	Remarks
Σ 1351	Σ	3	1830.61	272 36	22 82	0.00	0.00	
22 Ursae Majoris	Δ	4	67.88	271 19	22.79	— .01	— .01	
91	C	3	1903.22	270 5	22.74	.00	.00	V=1867.24

A = — 22.78 + 0.08 T D = + 0.77 — 1.39 T
3.0 0.26

Star	Obs'r	n	Epoch	p_0	s_0	d A	d D	Remarks
6 Leonis	O Σ	2	1840.21	74 40	36.82	—0.10	—0.02	
	O Σ	2	74.78	74 29	37.38	+ .31	+ .05	
92	Δ	3	75.47	74 25	37.00	— .08	— .01	V=1873.42
	C	3	1903.22	74 13	37.08	— .12	— .02	

A = + 35.63 + 0.33 T D = + 9.81 + 0.55 T
4.0 0.20

Star	Obs'r	n	Epoch	1850.0 p_0		1850.0 s_0	O.—C. d A	O.—C. d D	Remarks
				°	′	″	″	″	
7 Leonis	$O\Sigma$	2	1840.21	79	60	41.20	+0.05	+0.01	
	$O\Sigma$	3	75.60	79	59	41.00	— .02	— .07	
93	Doub	3	81.21	79	58	40.82	— .19	— .09	V=1875.06
	C	3	1903.22	79	40	41.10	+ .13	+ .14	

$A = +40.49 - 0.36\,T$ $D = +7.16 + 0.15\,T$

4.0   0.20

Star	Obs'r	n	Epoch	p_0		s_0	d A	d D	Remarks
9 Sextantis	$O\Sigma$	1	1841.23	292	12	52.17	—0.16	+0.09	
	$O\Sigma$	1	68.29	291	4	52.01	+ .10	— .11	
94	Doub.	3	81.25	290	40	52.07	+ .15	— .05	V=1879.74
	C	3	1903.22	289	51	52.51	— .13	+0.06	

$A = -48.30 - 1.81\,T$ $D = +19.36 - 2.98\,T$

3.0   0.14

Star	Obs'r	n	Epoch	p_0		s_0	d A	d D	Remarks
α Leonis	Σ	5	1836.24	306	40.0	176.90	+0.02	—0.01	
	Δ	5	64.78	306	36.8	176.94	— .19	+ .09	
95	β	2	79.18	306	37.1	176.10	+ .46	— .29	V=1869.67
	C	3	1903.22	306	34.2	176.57	— .07	+ .05	

$A = -141.88 + 0.27\,T$ $D = +105.55 - 0.74\,T$

3.5   0.23

Star	Obs'r	n	Epoch	p_0		s_0	d A	d D	Remarks
γ Leonis	$O\Sigma$	2	1851.78	293	46.0	210.72	+0.14	+0.09	A. C.
	$O\Sigma$	1	61.27	293	9.4	218.31	— .23	— .04	
96	$O\Sigma$	2	69.82	292	42.0	224.80	— .10	— .10	V=1874.77
	$O\Sigma$	2	79.78	292	13.8	232.45	.00	— .01	
	C	3	1904.43	291	8.4	251.68	+ .05	+ .04	

$A = -191.62 - 79.29\,T$ $D = +84.66 + 11.14\,T$

4.5   0.15

Star	Obs'r	n	Epoch	1850.0		O.—C.		Remarks
				p_0	s_0	d A	d D	
				° ′	″	″	″	
γ Leonis	O Σ	1	1852.27	320 24.1	112.52	+0.11	−0.34	C D
	O Σ	1	61.27	322 12.6	110.45	− .13	+ .18	
97	O Σ	2	69.82	323 45.3	107.97	− .37	− .11	V=1877.70
	O Σ	2	79.78	326 10.9	105.49	.00	+ .36	
	C	3	1904.43	302 19.7	333.01	+ .37	− .18	A D

$$A = -264.58 - 31.58\ T \qquad D = +171.71 + 12.04\ T$$
$$4.0 \qquad\qquad 0.12$$

Star	Obs'r	n	Epoch	p_0	s_0	d A	d D	Remarks
σ 362	O Σ	1	1840.23	331 49.8	60.22	+0.18	−0.05	
	O Σ	1	68.29	338 28.9	58.98	− .07	− .04	
98	O Σ	1	79.23	341 2.9	58.94	− .33	+ .16	V=1879.35
	C	2	1904.49	347 48.2	58.49	+ .11	− .04	

$$A = -26.16 + 25.12\ T \qquad D = +53.79 - 6.26\ T$$
$$2.5 \qquad\qquad 0.15$$

Star	Obs'r	n	Epoch	p_0	s_0	d A	d D	Remarks
χ Leonis	O Σ	1	1882.33	303 15.9	287.66	+0.04	−0.04	
99	β	1	1905.24	304 13.3	281.51	.00	+ .47	
	C	2	1907.24	304 11.1	280.58	− .01	− .21	V=1900.51

$$A = -251.55 + 34.00\ T \qquad D = +157.79 + 0.11\ T$$
$$2.0 \qquad\qquad 0.02$$

Star	Obs'r	n	Epoch	p_0	s_0	d A	d D	Remarks
σ 377	O Σ	1	1841.40	210 26	47.56	+0.08	−0.10	
100	Doub	3	80.04	219 13	58.81	− .11	+ .14	
	C	2	1904.55	222 50	66.48	+ .07	− .08	V=1882.12

$$A = -27.05 - 33.40\ T \qquad D = -41.96 - 12.29\ T$$
$$2.5 \qquad\qquad 0.13$$

Star	Obs'r	n	Epoch	p_0	s_0	d A	d D	Remarks
Σ 1517	O Σ	1	1871.25	104 19.4	198.68	+0.39	−0.15	½ (A + B), C.
101	O Σ	1	81.27	103 40.6	200.89	− .56	+ .20	
	C	2	1904.48	102 20.7	209.13	+ .08	− .04	V=1890.37

$$A = +184.49 + 36.19\ T \qquad D = -51.80 + 13.09\ T$$
$$2.0 \qquad\qquad 0.04$$

Star	Obs'r	n	Epoch	1850.0			O.—C.		Remarks
				p_0		s_0	dA	dD	
				°	′	″	″	″	
Σ 1516	Σ	12	1833.99	300	26	9.09	+0.03	—0.16	A B
	Σ	8	36.64	302	40	8.13	— .07	— .07	
	O Σ	9	44.10	313	59	5.06	+ .11	— .13	V=1862.33
	Δ	12	54.91	13	0	2.73	.00	+ .20	
	O Σ	8	57.07	31	28	3.05	+ .10	+ .37	
	Δ	9	57.32	35	9	2.74	— .01	+ .04	
102	Δ	4	63.35	70	0	4.14	— .13	— .12	
	O Σ	7	69.38	79	19	6.49	— .08	+ .32	
	Δ	2	78.35	90	52	10.14	+ .06	— .05	
	Hl	2	79.41	91	53	10.51	— .01	— .13	
	O Σ	1	89.39	95	8	14.76	+ .16	— .01	
	Hl	2	91.27	96	36	15.37	— .03	— .25	
	C	3	1904.54	98	28	20.89	0.00	— .10	

A = — 1.37 + 40.39 T D = + 3.00 — 10.94 T
14.5 0.64

Star	Obs'r	n	Epoch	p_0		s_0	dA	dD	Remarks
Σ 1516	O Σ	3	1858.87	294	3	8.19	—0.27	—0.18	A C
	O Σ	2	61.33	297	0	8.06	.00	+ .14	
	O Σ	3	66.49	297	9	7.73	+ .19	.00	V=1876.35
103	O Σ	3	72.54	297	33	7.61	+ .19	— .01	
	Hl	2	79.41	298	3	7.66	+ .01	+ .08	
	Hl	2	91.27	298	40	7.51	— .08	+ .07	
	C	3	1904.54	299	7	7.13	— .03	— .08	

A = — 7.43 + 2.24 T D = + 3.51 + 0.08 T
7.0 0.17

Star	Obs'r	n	Epoch	p_0		s_0	dA	dD	Remarks
δ Leonis	O Σ	3	1851.96	346	10.9	180.36	—0.02	+0.04	
104	H Σ	2	84.26	345	0.8	184.94	+ .08	— .13	
	C	3	1902.24	344	21.5	187.86	— .04	+ .08	V=1879.49

A = — 42.76 — 15.04 T D = + 174.87 + 11.39 T
3.0 0.13

Star	Obs'r	n	Epoch	1850.0 p_0	1850.0 s_0	O.—C. d A	O.—C. d D	Remarks
				° ′	″	″	″	
81 Leonis	$O\Sigma$	3	1840.26	339 18	58.53	−0.19	−0.22	
105	$O\Sigma$	2	72.66	344 19	57.58	+ .39	+ .44	
	C	3	1903.22	347 45	56.09	− .20	− .23	V=1872.05

A = − 19.14 + 14.00 T D = + 54.98 + 0.13 T
3.0 0.20

Star	Obs'r	n	Epoch	p_0	s_0	d A	d D	Remarks
61 Ursae Majoris	$O\Sigma$	2	1852.78	107 51.5	163.09	−0.14	−0.06	
106	$H\Sigma$	3	84.29	103 32.1	160.91	+ .39	+ .18	
	C	2	1902.33	101 14.1	159.28	− .25	− .10	V=1879.80

A = + 155.23 + 2.38 T D = − 51.02 + 38.44 T
3.0 0.13

Star	Obs'r	n	Epoch	p_0	s_0	d A	d D	Remarks
62 Ursae Majoris	$O\Sigma$	3	1852.61	297 16	104.91	+0.07	−0.02	
107	$H\Sigma$	2	84.26	298 31	93.35	− .19	+ .06	
	C	2	1904.47	299 2	85.54	+ .12	− .03	V=1880.45

A = − 94.29 + 36.26 T D = + 48.41 − 11.40 T
3.0 0.14

Star	Obs'r	n	Epoch	p_0	s_0	d A	d D	Remarks
β Virginis	$O\Sigma$	2	1852.78	283 25.5	202.93	+0.34	−0.01	
108	$H\Sigma$	2	84.30	283 53.1	228.93	− .93	+ .02	
	C	2	1902.26	284 13.3	241.60	+ .59	− .02	V=1879.78

A = − 195.65 − 74.85 T D = + 46.44 + 24.75 T
3.0 0.13

Star	Obs'r	n	Epoch	p_0	s_0	d A	d D	Remarks
Σ 1607	Σ	3	1830.99	350 20	33.07	+0.07	−0.13	
	$O\Sigma$	2	45.88	352 24	32.42	− .06	+ .11	
109	Δ	6	65.05	355 26	31.25	− .06	+ .04	V=1862.36
	$O\Sigma$	1	68.36	356 6	31.25	.00	+ .22	
	C	2	1904.50	362 38	29.16	+ .05	− .11	

A = − 3.85 + 9.43 T D = + 31.83 − 4.74 T
4.5 0.31

Star	Obs'r	n	Epoch	1850.0 p_0		1850.0 s_0	O.—C. dA	O.—C. dD	Remarks
				°	′	″	″	″	
12 Comae	O Σ	2	1840.13	167	25	65.18	—0.02	+0.02	
110	Doub.	3	79.20	167	8	65.16	+ .05	— .03	
	C	3	1903.23	167	20	65.22	— .03	+ .02	V=1874.19

A = + 14.23 + 0.19 T D = — 63.62 — 0.04 T
3.0 0.20

Star	Obs'r	n	Epoch	p_0		s_0	dA	dD	Remarks
Σ 1658	Σ	3	1830.64	341	31	2.02	+0.05	—0.07	A B
	Δ	5	69.08	349	9	2.24	— .06	— .04	
	O Σ	1	70.31	350	55	2.32	— .04	+ .05	V=1873.07
111	O Σ	1	81.30	356	55	2.87	+ .09	+ .54	
	Hl	4	85.34	353	40	2.36	— .06	+ .00	
	C	2	1904.50	360	38	2.32	+ .06	— .16	

A = — 0.52 + 0.90 T D = + 2.12 + 0.67 T
5.0 0.30

Star	Obs'r	n	Epoch	p_0		s_0	dA	dD	Remarks
Σ 1658	O Σ	1	1870.31	257	35.5	102.64	—0.03	+0.12	A C
112	O Σ	1	81.30	258	15.0	104.42	+ .05	— .21	
	C	2	1904.50	260	4.9	108.30	.00	+0.05	V=1890.15

A = — 96.42 — 18.85 T D = — 24.23 + 10.17 T
2.0 0.07

Star	Obs'r	n	Epoch	p_0		s_0	dA	dD	Remarks
Virginis	O Σ	2	1851.83	185	49.5	255.31	+ .32	— .03	½ (A + B), C
	O Σ	1	71.34	183	42.3	254.68	— .29	+ .02	
113	H Σ	2	84.28	182	16.3	254.45	— .59	+ .05	V=1878.93
	C	3	1904.48	179	42.0	254.57	+ .42	— .04	

A = — 27.17 + 51.54 T D = — 253.96 — 1.02 T
3.5 0.14

Star	Obs'r	n	Epoch	1850.0 p_0	1850.0 s_0	O.—C. dA	O.—C. dD	Remarks
				° ′	″	″	″	
Σ 1678	Σ	3	1828.29	212 30	32.74	+0.04	+0.05	
	Σ	3	36.25	210 42	32.46	+ .05	+ .15	
	OΣ	4	42.62	208 58	32.64	+ .01	— .18	V=1859.29
	Δ	3	58.36	205 32	32.57	— .23	— .22	
114	Δ	4	63.23	204 4	32.15	+ .08	+ .07	
	Δ	3	67.65	202 59	32.24	+ .04	— .04	
	Δ	1	70.42	202 25	32.19	.00	+ .03	
	OΣ	1	76.36	201 28	32.18	— .18	+ .32	
	C	2	1904.49	194 1	32.51	+ .08	— .02	

A = — 14.88 + 12.72 T D = — 28.77 + 5.04 T
8.0 0.41

Star	Obs'r	n	Epoch	p_0	s_0	dA	dD	Remarks
33 Virginis	OΣ	3	1852.62	183 15.5	192.46	+ .07	— .03	
115	HΣ	3	84.33	187 19.0	180.02	— .18	+ .08	
	C	2	1904.49	190 2.3	172.87	+ .11	— .05	V=1880.48

A = — 10.03 — 37.06 T D = — 193.38 + 42.59 T
3.0 0.14

Star	Obs'r	n	Epoch	p_0	s_0	dA	dD	Remarks
Σ 1682	Σ	3	1831.61	308 46	33.66	—0.10	+0.09	
Pi. xii 196	Δ	4	65.83	306 45	32.28	+ .20	— .18	
116	C	3	1903.28	304 32	31.64	— .09	+ .09	V=1866.91

A = — 26.10 + 0.22 T D = + 20.18 — 4.36 T
3.0 0.26

Star	Obs'r	n	Epoch	p_0	s_0	dA	dD	Remarks
δ Virginis	β	2	1879.30	142 20.0	152.08	0.00	+0.08	
117	β	3	1901.29	139 39.7	158.12	.00	— .36	
	C	2	1907.48	138 46.1	159.28	.00	+ .28	V=1896.02

A = + 80.39 + 42.78 T D = — 120.85 + 1.36 T
3.0 0.04

Star	Obs'r	n	Epoch	1850.0 p_0	1850.0 s_0	O.—C. d A	O.—C. d D	Remarks
				° ′	″	″	″	
42 Comae	$O\Sigma$	3	1851 34	321 43.3	135.65	+0.04	—0.06	
118	$H\Sigma$	2	84.34	325 25.1	123 83	— .10	+ .15	
	C	3	1902.38	327 45.1	117.19	+ .08	— .10	V=1879.35

A = — 84.65 + 42.11 T D = + 106.74 — 14.38 T
3.0 0.13

Star	Obs'r	n	Epoch	p_0	s_0	d A	d D	Remarks
43 Comae	$O\Sigma$	2	1850.85	279 13.0	131.52	+0.11	+0.10	
	$O\Sigma$	2	53.85	278 3.9	128.88	+ .03	— .16	
119	$H\Sigma$	3	84.35	264 51.9	104.96	— .36	+ .11	V=1872.86
	C	3	1902.38	253 55.3	93.76	+ .25	— .07	

A = — 130.61 + 76.89 T D = + 21.75 — 91.00 T
4.0 0.18

Star	Obs'r	n	Epoch	p_0	s_0	d A	d D	Remarks
σ 434	$O\Sigma$	1	1840.34	57 31	49.32	—0.24	—0.04	
120	Doub	3	79.34	52 54	63.62	+ .31	+ .07	
	C	2	1904.48	50 36	72.30	— .18	— .05	V=1881.60

A = + 44.01 + 22.00 T D = + 29.47 + 30.24 T
2.5 0.14

Star	Obs'r	n	Epoch	p_0	s_0	d A	d D	Remarks
61 Virginis	Kn	1	1862.29	22 37.3	169.29	+0.08	+0.23	
	β	2	78.35	25 21.1	190.69	— .56	— .06	
121	Hl	3	88.34	27 10.9	204.97	+ .71	— .22	V=1890.78
	β	3	1903.20	28 53.8	225.91	+ .35	+ .11	
	C	2	07.48	29 11.3	231.47	— .53	+ .05	

A = + 51.87 + 107.06 T D = + 143.51 + 101.81 T
4.5 0.10

Star	Obs'r	n	Epoch	1850.0 p_0		1850.0 s_0	O.—C. d A	O.—C. d D	Remarks
				°	′	″	″	″	
70 Virginis	*O* Σ	1	1852.27	144	2.6	304.39	—0.06	+0.02	
122	*H* Σ	2	84.32	140	33.0	294.60	+ .09	— .02	
	C	3	1904.52	138	15.7	288.97	— .05	+ .01	V=1885.99

A = + 178.29 + 25.92 T D = — 247.88 + 59.14 T

2.5 0.09

Σ 1750	Σ	4	1831.53	16	7	30.07	—0.03	+0.32	
72 Virginis	Σ	1	52.22	16	49	28.99	+ .01	— .67	
	Δ	3	67.64	16	30	29.41	— .03	— .09	V=1868.42
123	β	2	79.30	16	12	29.25	— .21	— .09	
	C	3	1903.31	17	4	29.47	+ .25	+ .21	

A = + 8.37 + 0.03 T D = + 28.43 — 0.89 T

4.5 0.28

η Bootis	*O* Σ	4	1851.86	115	47.8	117.97	+0.12	0.00	
	O Σ	1	70.35	112	41.5	115.63	— .35	+ .05	
124	*H* Σ	2	84.36	110	11.3	114.75	.00	— .03	V=1878.84
	C	2	1904.53	106	31.8	113.48	+ .06	+ .02	

A = + 106.08 + 4.87 T D = — 52.02 + 36.18 T

3.5 0.15

Σ 3124	Σ	4	1836.22	33	7	38.05	+0.04	+0.01	
ι Bootis	*O* Σ	2	51.62	33	7	38.08	— .01	— .03	
	O Σ	1	56.58	32	58	38.10	— .10	+ .01	V=1860.49
125	*O* Σ	4	76.54	33	13	38.31	+ .10	— .01	
	C	1	1902.48	33	8	38.47	+ .01	+ .01	

A = + 20.81 + 0.44 T D = + 31.92 + 0.54 T

4.5 0.18

Star	Obs'r	n	Epoch	1850.0 p_0	1850.0 s_0	O.—C. d A	O.—C. d D	Remarks
				° ′	″	″	″	
ϑ Bootis	*O* Σ	1	1854.64	181 57	69.08	+0.05	−0.22	
	O Σ	2	77.00	182 5	68.61	+ .11	+ .33	
126	*H* Σ	2	83.47	182 23	69.17	− .21	− .17	V=1882.99
	C	3	1902.67	182 17	69.11	+ .08	− .06	

A = − 2.36 − 0.90 T D = − 68.79 − 0.42 T

3.5 0.08

ρ Bootis	β	2	1879.87	334 7	53.25	−0.05	−0.26	
	β	1	89.15	334 45	52.67	− .32	+ .46	
	Ho	4	92.50	335 16	51.78	+ .16	+ .22	V=1896.31
127	β	2	1902.18	336 0	50.06	+ .34	+ .01	
	β	3	03.11	335 42	50.13	− .02	+ .06	
	C	2	07.48	335 36	49.32	− .30	− .17	

A = − 26.71 + 11.46 T D = + 51.56 − 11.06 T

5.5 0.05

γ Bootis	β	2	1878.25	98 43	26.18	− 0.06	+0.17	A B
	β	3	91.24	103 47	28.23	+ .05	− .21	
128	β	2	98.27	105 42	29.38	+ .15	− .15	V=1895.94
	β	2	1904.41	107 26	30.03	− .15	− .07	
	C	2	07.51	107 34	30.58	+ .02	+ .26	

A = + 22.91 + 10.82 T D = + 1.03 − 18.30 T

5.0 0.05

σ Bootis	*O* Σ	2	1852.40	81 33.0	248.01	−0.17	−0.23	A. B.
	O Σ	1	70.46	81 53.6	244.71	+ .48	+ .05	
129	*O* Σ	1	81.30	82 2.3	242.00	+ .11	+ .42	V=1876.97
	C	3	1902.64	82 37.1	237.04	− .11	.00	

A = + 245.98 − 20.53 T D = + 36.98 − 12.38 T

3.0 0.13

Star	Obs'r	n	Epoch	1850.0 p_0	1850.0 s_0	O.—C. d A	O.—C. d D	Remarks
				° ′	″	″	″	
σ Bootis	$O\Sigma$	1	1853.42	181 10	57.65	—0.09	—0.01	B C
	$O\Sigma$	1	70.46	180 28	58.53	+ .41	+ .02	
130	$O\Sigma$	1	81.30	181 8	59.15	— .42	— .02	V=1882.10
	C	3	1902.65	186 27	60.26	+ .05	+ .01	

A = — 1.12 + 1.14 T　　　　D = — 57.45 + 5.36 T

2.5　　　　0.09

Star	Obs'r	n	Epoch	p_0	s_0	d A	d D	Remarks
Sh. 190	β	1	1878.32	166 37	105.5	+0.10	—0.03	A E
131	β	2	1905.34	183 55	54.93	— .31	+ .15	
	C	1	1907.49	185 39	51.69	+ .57	— .28	V=1899.12

A = + 53.36 — 102.71 T　　　　D = — 152.63 + 176.53 T

2.0　　　　0.03

Star	Obs'r	n	Epoch	p_0	s_0	d A	d D	Remarks
Sh. 190	β	1	1878.32	322 18.9	121.6	+0.05	—0.08	A F
	Wils.	1	86.38	323 2.8	138.07	— .12	+ .10	
132	β	1	1905.28	324 19.5	175.98	+ .16	+ .05	V=1897.00
	C	2	07.52	324 21.5	180.50	— .04	— .05	

A = — 44.56 — 105.32 T　　　　D = + 47.41 + 172.69 T

2.5　　　　0.04

Star	Obs'r	n	Epoch	p_0	s_0	d A	d D	Remarks
Σ 1894	Σ	4	1831.09	38 41	19.46	—0.30	+0.14	
18 Librae	Σ	1	52.22	40 48	19.63	+ .36	— .22	
133	Δ	3	66.98	38 56	19.53	+ .07	— .13	V=1865.00
	C	3	1903.33	38 20	19.75	+ .04	+ .10	

A = + 12.46 + 0.04 T　　　　D = + 15.08 + 0.19 T

3.5　　　　0.27

Star	Obs'r	n	Epoch	1850.0 p_0		1850.0 s_0	O.—C. dA	O.—C. dD	Remarks
				°	′	″	″	″	
1930	Σ	3	1831.69	40	36	10.33	+0.06	+0.07	
5 Serpentis	Σ	3	36.42	40	54	10.07	— .06	— .12	
	OΣ	2	48.38	39	14	10.52	— .03	+ .27	V=1868.39
	Δ	3	65.93	40	30	10.35	.00	— .17	
	β	2	79.42	39	54	10.90	+ .24	+ .13	
134	Hl	3	79.51	39	26	10.06	— .37	— .41	
	Hl	3	84.44	40	3	10.71	+ .15	+ .04	
	Hl	2	86.42	40	14	10.83	+ .25	+ .06	
	C	3	1903.33	37	51	10.73	— .20	— .10	

$A = +6.69 + 0.18\,T$ $\quad$ 9.0

$D = +7.90 + 0.90\,T$ $\quad$ 0.48

Star	Obs'r	n	Epoch	p_0		s_0	dA	dD	Remarks
Σ 1970	Σ	4	1832.14	264	55	30.65	—0.01	—0.14	
β Serpentis	Σ	1	51.80	265	30	30.71	— .05	+ .27	
135	Δ	5	67.81	265	3	30.69	+ .04	+ .09	V=1865.48
	C	3	1903.32	264	26	30.88	— .02	— .09	

$A = -30.56 - 0.29\,T$ $\quad$ 3.5

$D = -2.66 - 0.46\,T$ $\quad$ 0.26

Star	Obs'r	n	Epoch	p_0		s_0	dA	dD	Remarks
39 Serpentis	OΣ	1	1862.38	130	35.1	106.41	+0.02	+0 01	
136	HΣ	1	83.60	124	12.1	101.77	— .03	+ .15	
	C	2	1904.54	117	33.9	98.80	+ .00	— .06	V=1888.77

$A = +78.84 + 16.05\,T$ $\quad$ 2.0

$D = -76.16 + 55.94\,T$ $\quad$ 0.05

Star	Obs'r	n	Epoch	p_0		s_0	dA	dD	Remarks
γ Serpentis	OΣ	2	1852.40	300	0.1	141.35	+0.19	+0.11	
137	HΣ	2	83.47	309	32.3	173.54	— .51	— .25	
	C	3	1902.68	314	10.7	194.72	+ .31	+ .15	V=1879.52

$A = -121.77 - 34.53\,T$ $\quad$ 3.0

$D = +67.48 + 129.23\,T$ $\quad$ 0.13

Star	Obs'r	n	Epoch	1850.0			O.—C.		Remarks
				p_0		s_0	d A	d D	
				°	′	″	″	″	
Σ 1993	Σ	3	1831.76	37	36	33.97	0.00	0.00	
	O Σ	3	40.79	38	0	33.40	+ .16	— .03	
138	*Δ*	5	65.43	38	0	31.55	— .10	+ .09	V=1862.09
	O Σ	1	75.47	38	4	30.46	— .38	— .12	
	C	3	1903.72	39	20	28.87	+ .15	+ .01	

A = + 20.07 — 3.57 T   D = + 25.75 — 6.39 T
4.5   0.32

σ 502	*O* Σ	1	1841.42	108	6	42.42	+0.17	+ .09	
139	*O* Σ	1	81.37	110	37	45.31	— .47	— .23	
	C	3	1903.72	110	55	47.69	+ .16	+ .08	V=1882.56

A = + 40.72 + 6.83 T   D = — 13.80 — 6.15 T
2.0   0.13

ρ Coronae	*O* Σ	3	1853.83	108	46	74.25	—0.12	—0.06	
	O Σ	1	66.66	100	56	74.78	+ .33	+ .01	
	H Σ	3	83.46	91	4	76.63	+ .03	+ .14	V=1883.78
140	C	3	1902.64	80	53	81.62	+ .02	+ .09	
	C	3	03.72	80	31	81.84	— .07	— .17	

A = + 69.65 + 20.78 T   D = — 26.72 + 75.14 T
4.5   0.18

49 Serpentis	*O* Σ	1	1854.39	128	12.9	262.45	—0.24	—0.01	½ (A + B), C
141	*O* Σ	1	62.38	127	41.5	259.35	+ .32	+ .33	
	H Σ	1	84.68	126	46.1	250.34	— .07	— .54	V=1881.34
	C	3	1902.63	125	40.0	242.68	.00	+ .09	

A = + 207.28 — 19.25 T   D = — 164.22 + 43.01 T
2.5   0.10

Star	Obs'r	n	Epoch	1850.0		O.—C.		Remarks
				p_0	s_0	d A	d D	
				° ′	″	″	″	
σ Coronae	Σ	5	1837.09	88 36	43.45	−0.15	+0.09	½ (A + B), C
	Σ	2	40.58	88 25	44.82	+ .19	+ .02	
	OΣ	11	51.55	87 40	47.78	− .02	− .04	V=1865.89
	OΣ	7	55.52	87 22	49.12	+ .04	− .01	
142	OΣ	7	60.26	86 58	50.45	− .06	+ .01	
	OΣ	4	66.91	86 46	52.69	+ .21	− .10	
	OΣ	5	75.64	86 7	55.24	+ .14	+ .05	
	OΣ	3	82.51	85 46	57.08	− .06	+ .04	
	Doo.	3	1900.50	84 55	62.42	− .14	+ .09	
	C	3	02.63	84 59	63.22	+ .03	− .06	

A = + 47.39 + 29.54 T
11.0

D = + 1.88 + 7.05 T
0.49

γ Herculis	OΣ	2	1840.52	242 23	40.37	+0.06	−0.21	
	Σ	1	52.22	241 59	40.34	− .08	+ .29	
143	OΣ	2	75.56	239 42	40.50	− .06	+ .23	V=1870.15
	C	3	1903.33	236 33	40.89	+ .05	− .15	

A = − 35.58 + 2.66 T
2.5

D = − 19.09 − 6.17 T
0.22

23 Herculis	OΣ	1	1840.58	19 39	36.20	+0.10	−0.02	
144	OΣ	2	75.56	18 42	35.10	− .12	+ .01	
	C	3	1903.33	18 30	34.81	+ .07	− .01	V=1879.67

A = + 11.88 − 1.99 T
2.5

D = + 33.88 − 2.50 T
0.13

Star	Obs'r	n	Epoch	1850.0 p_0	1850.0 s_0	O.—C. dA	O.—C. dD	Remarks.
				° '	"	"	"	
ω Herculis	β	2	1878.58	103 18	33.82	—0.08	+0.38	
	β	2	79.46	104 6	34.01	+ .04	— .16	
145	β	3	90.37	103 42	33.43	+ .02	— .34	V=1890.08
	A	3	98.50	102 56	32.98	+ .10	— .21	
	C	4	1903.48	101 43	32.40	— .09	+ .34	

A = + 34.36 — 4.77 T 5.0 D = — 9.59 + 5.00 T 0.05

Star	Obs'r	n	Epoch	p_0	s_0	dA	dD	Remarks.
O Σ 311	O Σ	2	1845.86	183 47	13.34	—0.10	+0.04	
	O Σ	1	52.46	183 31	12.60	+ .21	— .09	
	Δ	5	68.57	187 20	10.50	+ .12	— .04	V=1878.52
146	O Σ	2	71.07	189 16	10.11	— .09	+ .07	
	A	3	96.47	198 52	7.12	.00	— .02	
	Hu	3	98.48	200 37	6.91	— .07	— .01	
	C	2	1903.72	203 9	6.23	+ .06	+.04	

A = — 0.91 — 2.99 T 6.5 D = — 12.81 + 13.10 T 0.29

Star	Obs'r	n	Epoch	p_0	s_0	dA	dD	Remarks.
Σ 2082	Σ	3	1828.43	92 11	22.40	+ .15	— .07	
42 Herculis	Δ	3	66.35	92 3	22.74	— .23	+ .06	
147	O Σ	1	74.67	91 30	22.77	— .35	+ .30	V=1867.26
	C	3	1903.35	92 36	23.95	+ .25	— .13	

A = + 22.64 + 1.93 T 3.5 D = — 0.83 — 0.22 T 0.29

Star	Obs'r	n	Epoch	p_0	s_0	dA	dD	Remarks.
41 Herculis	O Σ	1	1854.39	191 21.9	163.65	+0.09	+0.03	A B
	Doub.	1	77.52	191 15.0	163.29	+ .23	+ .12	
148	O Σ	1	82.42	191 28.0	163.74	— .51	— .24	V=1883.94
	C	3	1902.68	191 12.9	163.15	+ .09	+ .03	

A = — 32.39 + 1.08 T 2.5 D = — 160.50 + 0.84 T 0.08

Star	Obs'r	*n*	Epoch	1850.0 p_0	1850.0 s_0	O.—C. d A	O.—C. d D	Remarks
				° ′	″	″	″	
41 Herculis	*O* Σ	1	1854.39	243 47.7	175.88	+0.10	+0.05	A C
149	*O* Σ	1	82.42	245 4.5	167.38	— .21	— .10	
	C	3	1902.68	246 5.3	160.72	+ .06	+ .02	V=1885.54

A = — 158.88 + 22.58 T D = — 78.84 + 25.96 T
2.0 0.08

43 Herculis	*O* Σ	2	1840.52	230 37	81.81	—0.23	—0.19	
	Σ	1	52.22	230 20	80.99	+ .93	+ .25	
150	*O* Σ	1	76.61	230 37	82.09	+ .06	+ .32	V=1871.89
	Doub.	3	79.27	230 40	82.71	— .44	+ .03	
	C	3	1903.37	230 10	82.82	+ .15	— .14	

A = — 63.25 — 0.93 T D = — 51.89 — 1.90 T
4.0 0.22

19 Ophiuchi	Σ	3	1832.14	92 29	22.26	+0.07	+0.01	
151	*Δ*	3	65.59	91 57	22.34	— .13	— .04	
	C	3	1903.37	91 3	22.86	+ .06	+ .01	V=1867.03

A = + 22.32 — 0.89 T D = — 0.84 + 0.76 T
3.0 0.25

Σ 2120	W. H.	1	1783.20	41 57	11.88	+2.19	+0.30	p = o
	Σ	2	1829.60	11 17	3.84	+ .07	— .02	
	Σ	5	33.28	3 32	3.47	— .08	+ .06	V=1872.44
	Σ	7	35.30	1 44	3.21	+ .02	+ .01	
152	Σ	7	37.07	359 45	3.06	+ .11	+ .04	
	O Σ	2	41.12	345 45	2.83	— .15	+ .14	
	O Σ	3	47.57	324 37	2.19	— .02	— .16	
	O Σ	3	50.90	314 34	2.25	— .09	— .13	
	O Σ	3	51.97	306 53	2.19	— .03	— .18	

Star	Obs'r	n	Epoch	1850.0		O.—C.		Remarks
				p_0	s_0	d A	d D	
				° ′	″	″	″	
Σ 2120 — Con.	O Σ	2	1855.10	296 35	2.30	0.00	−0.14	
	O Σ	3	58.62	287 43	2.65	— .08	.00	
	Δ	10	63.04	276 55	3.01	— .06	.00	
	Δ	10	65.09	273 0	2.98	+ .17	+ .01	
	Δ	9	67.04	269 21	3.26	+ .09	+ .01	
	O Σ	2	67.70	269 18	3.48	— .06	+ .07	
	Δ	7	68.93	266 14	3.46	+ .10	+ .01	
	Δ	8	70.95	263 11	3.77	+ .03	.00	
	Du	3	71.14	265 14	3.53	+ .27	+ .18	
	Δ	8	72.97	260 39	4.02	+ .03	.00	
	O Σ	2	73.66	260 54	4.21	— .10	+ .05	
	Δ	8	74.99	258 17	4.21	+ .08	+ .01	
	Du	7	75.53	259 15	4.37	— .02	+ .11	
	Sp	4	75.54	258 4	4.16	+ .20	+ .06	
	Hl	3	76.51	256 46	4.59	— .11	— .03	
	Δ	8	77.01	256 5	4.52	+ .04	— .02	
	O Σ	5	77.53	254 29	4.54	+ .10	— .09	
	Sp	4	77.57	256 18	4.41	+ .20	+ .08	
	Δ	4	78.51	255 58	4.80	— .08	+ .06	
	Sp	5	79.57	255 18	4.75	+ .11	+ .13	
	Hl	2	79.64	254 2	4.88	+ .02	.00	
	Sp	3	80.57	254 48	5.07	— .09	+ .10	
	Hl	2	80.56	252 26	5.10	— .04	— .11	
	Hl	3	81.50	252 48	5.36	— .21	— .05	
	Hl	2	82.51	251 18	5.47	— .18	— .12	
	Sp	3	82.54	252 16	5.25	+ .02	+ .03	
	Hl	3	83.57	252 4	5.54	— .13	+ .03	
	Sp	6	83.60	251 59	5.44	— .03	+ .06	
	O Σ	4	83.83	254 14	5.42	— .05	+ .19	
	Hl	3	84.54	251 29	5.69	— .16	+ .03	

Star	Obs'r	n	Epoch	1850.0 p_0		1850.0 s_0	O.—C. dA	O.—C. dD	Remarks
				°	′	″	″	″	
Σ 2120—Con.	Sp	3	1884.57	249	41	5.51	+0.08	−0.07	
	Hl	2	85.52	250	28	5.74	− .07	+ .02	
	Sp	3	85.59	250	6	5.50	+ .19	+ .07	
	Hl	4	86.50	248	44	5.90	− .05	− .10	
	Hl	3	88.55	247	28	6.19	− .03	− .12	
	C	3	92.59	245	49	6.67	+ .04	− .07	
	C	2	95.52	245	46	7.00	+ .04	− .05	
	C	3	1903.44	241	20	8.20	+ .09	− .17	
	C	2	06.61	241	46	8.66	− .02	− .01	

A = − 1 53 − 10.78 T D = + 1.67 − 10.23 T
47.0 1.44

Star	Obs'r	n	Epoch	p_0		s_0	dA	dD	Remarks
60 Herculis	Σ	1	1852.22	310	39	51 57	−0.15	−0.01	
153	β	3,2	78.76	310	10	53.13	+ .16	− .04	
	C	3	1903.39	309	27	55.05	− .08	+ .04	V=1883.30

A = − 38.82 − 6.76 T D = + 33.56 + 2.58 T
2.5 0.09

Star	Obs'r	n	Epoch	p_0		s_0	dA	dD	Remarks
δ Herculis	Σ	6	1831.72	173	55	25.62	−0.01	+0.09	
	Σ	5	35.62	174	12	24.98	+ .11	+ .08	
	Σ	6	37.16	174	30	24.73	+ .08	+ .08	V=1864.45
	OΣ	4	41.66	175	51	24.14	− .18	− .12	
	OΣ	3	47.37	176	27	23.04	− .04	+ .02	
	OΣ	3	56.01	177	42	21.61	+ .09	+ .02	
154	OΣ	3	61.48	179	16	20.71	− .09	+ .02	
	Δ	9	63.14	179	29	20.49	− .02	− .03	
	Δ	12	65.83	179	53	20.11	+ .04	− .08	
	Δ	7	68.07	180	29	19.74	+ .02	− .08	
	Δ	8	70.00	180	55	19.42	+ .02	− .07	
	Δ	8	72.00	181	35	19.10	− .04	− .07	

Star	Obs'r	n	Epoch	1850.0		O.—C.		Remarks
				p_0	s_0	d A	d D	
				° ′	″	″	″	
δ Herculis—Con.	$O\Sigma$	3	1872.91	182 12	18.80	−0.15	+0.09	
	Δ	8	74.04	181 45	18.77	+ .08	− .07	
	Δ	8	76.01	182 5	18.43	+ .14	− .04	
	$O\Sigma$	1	76.49	182 21	18.43	+ .09	− .11	
	Δ	8	78.02	182 41	18.18	+ .12	− .11	
	Hl	2	79.57	183 53	17.76	− .11	+ .08	
	Hl	2	84.53	185 46	17.00	− .21	+ .08	
	C	3	1903.37	191 50	14.11	+ .10	+ .13	

A = + 1.26 − 7.97 T   D = − 22.59 + 16.21 T
19.5   0.63

Star	Obs'r	n	Epoch	p_0	s_0	d A	d D	Remarks
72 Herculis	$O\Sigma$	3	1853 35	327 35.0	162.64	−0.04	−0.07	
	$O\Sigma$	2	59.04	328 25.1	167.95	− .10	− .09	
155	$H\Sigma$	2	83.48	331 43.1	191.31	+ .28	+ .41	V=1874.66
	C	3	1902.76	333 29.5	209.51	− .18	− .23	

A = − 86.72 + 12.53 T   D = + 133.97 + 101.88 T
4.0   0.16

Star	Obs'r	n	Epoch	p_0	s_0	d A	d D	Remarks
54 Ophiuchi	Σ	3	1830.19	76 39	21.43	+0.02	−0.13	
	Σ	2	36.72	75 11	21.49	− .04	+ .27	
156	Δ	4	67.95	74 45	21.59	+ .06	− .25	V=1859.56
	C	3	1903.39	71 44	21.79	− .02	+ .11	

A = + 20.79 − 0.15 T   D = + 5.52 + 2.24 T
4.0   0.34

Star	Obs'r	n	Epoch	p_0	s_0	d A	d D	Remarks
ψ Draconis	$O\Sigma$	1	1857.67	128 28.2	101.52	+0.09	+0.04	
157	$H\Sigma$	1	84.68	125 51.6	96.20	− .23	− .10	
	C	3	1902.74	123 39.1	93.07	+ .07	+ .03	V=1886.96

A = + 79.73 − 4.41 T   D = − 65.15 + 25.71 T
2.0   0.07

Star	Obs'r	n	Epoch	1850.0 p_0		1850.0 s_0	O.—C. d A	O.—C. d D	Remarks
				°	′	″	″	″	
67 Ophiuchi	$O\Sigma$	2	1840.52	142	41	54.48	+0.04	+0.09	
	$O\Sigma$	1	68.76	142	52	54.46	— .02	+ .02	
158	Doub.	4	77.55	142	55	54.47	— .03	.00	V=1873.78
	β	1	78.57	143	11	54.74	— .06	— .35	
	C	2	1903.38	142	54	54.43	+ .05	+ .11	

A = + 32.96 — 0.31 T D = — 43.40 — 0.19 T

4.0 0.20

Star	Obs'r	n	Epoch	1850.0 p_0		1850.0 s_0	O.—C. d A	O.—C. d D	Remarks
70 Ophiuchi	Hl	3	1878.84	49	44	87.21	+0.06	—0.22	½ (A + B), a
	Hl	2	82.79	47	41	92.40	+ .47	+ .26	Hall's notation
	Hl	3	86.52	45	12	93.56	+ .10	— .19	V=1892.58
159	β	2	89.30	43	25	95.17	+ .38	+0.13	
	Doo	3	97.51	38	22	98.68	—1.40	+ .14	
	β	4	1905.60	36	12.5	105.12	+ .18	+ .04	
	C	3	07.49	35	34.9	106.29	+ .19	— .13	

A = + 74.18 — 22.38 T D = + 25.76 + 108.11 T

7.0 0.07

Star	Obs'r	n	Epoch	1850.0 p_0		1850.0 s_0	O.—C. d A	O.—C. d D	Remarks
70 Ophiuchi	Hl	3	1878.84	197	59	71.38	—0.04	—0.10	½ (A + B), b
	Hl	2	82.79	198	1	65.60	+ .29	— .02	
	Hl	3	86.53	200	37	62.50	+ .08	— .35	V=1891.76
160	β	2	89.30	203	31	59.45	— .41	+ .56	
	β	4	1905.60	214	24	47.29	— .45	+ .25	
	C	3	07.50	214	35	45.87	+ .50	— .33	

A = — 14.47 — 21.55 T D = — 98.92 + 109.26 T

6.0 0.07

Star	Obs'r	n	Epoch	1850.0 p_0		1850.0 s_0	O.—C. d A	O.—C. d D	Remarks
70 Ophiuchi	Hl	3	1886.52	224	11.6	165.92	0.00	0.00	½ (A + B), c.
161	β	1	1905.62	230	6.5	155.85	+ .10	— .05	
	C	3	07.46	230	43.9	154.96	— .06	+ .03	V=1898.72

A = — 108.38 — 20.65 T D = — 160.98 + 110.00 T

2.5 0.025

Star	Obs'r	*n*	Epoch	1850.0 p_0	1850.0 s_0	O.–C. dA	O.–C. dD	Remarks
				° ′	″	″	″	
η Serpentis	Σ	3	1836 46	77 6.7	112.70	+0.06	–0.11	
	Δ	5	67.70	69 36.9	135.19	– .14	+ .29	
162	*O* Σ	1	68.55	69 42.3	135.78	– .01	– .29	V=1870.62
	O Σ	1	82.55	66 57.9	146.89	+ .20	+ .51	
	C	4	1902.67	64 12.6	162.14	+ .02	– .19	

A = + 117.20 + 54.63 T D = + 34.69 – 68.44 T
4.0 0.23

Star	Obs'r	*n*	Epoch	p_0	s_0	dA	dD	Remarks
109 Herculis	*O* Σ	1	1854.70	320 44.1	204.80	–0.25	–0.18	
	O Σ	1	68.55	321 4.0	208.81	+ .81	+ .39	
163	*H* Σ	2	83.54	320 43.9	213.79	– .39	– .12	V=1882.60
	C	3	1902.64	320 51.8	219.45	+ .11	+ .02	

A = – 128.45 – 19.34 T D = + 157.62 + 23.91 T
3.0 0.09

Star	Obs'r	*n*	Epoch	p_0	s_0	dA	dD	Remarks
Σ 2322	Σ	2	1828.65	170 23	19.58	–0.09	+0.17	
	Δ	3	66.77	169 1	20.33	+ .17	– .33	
164	*β*	1	79.50	168 52	20.16	+ .08	– .12	V=1868.18
	C	3	1903.47	168 42	19.94	– .11	+ .20	

A = + 3.55 + 0.88 T D = – 19.56 – 0.34 T
3.5 0.29

Star	Obs'r	*n*	Epoch	p_0	s_0	dA	dD	Remarks
29 Scuti	Σ	3	1829.58	257 47	12.35	+0.03	+0. 2	
165	*Δ*	3	66.32	256 37	12.25	– .07	– .04	
	C	3	1903.72	255 26	11.94	+ .03	+ .01	V=1866.54

A = – 11.96 + 0.70 T D = – 2.73 – 0.52 T
3.0 0.27

Star	Obs'r	n	Epoch	1850.0 p_0	1850.0 s_0	O.—C. d A	O.—C. d D	Remarks
				° ′	″	″	″	
α Lyrae	Σ	96	1837.65	138 22	43.02	+0.07	−0.14	
	O Σ	75	52.65	144 53	44.11	− .16	+ .24	
	Δ	11	66.52	150 29	48.95	+ .02	− .07	V=1865.26
166	Hl	6	81.60	155 55	50.71	+ .10	− .13	
	Hl	4	90.60	158 52	52.79	+ .19	− .16	
	C	4	1902.64	162 59	56.37	− .21	+ .11	

A = + 26.07 − 19.95 T D = − 35.55 − 28.72 T
8.0 0.42

Star	Obs'r	n	Epoch	p_0	s_0	d A	d D	Remarks
Σ 2396	Σ	3	1829.60	232 39	11.74	−0.03	−0.17	
	O Σ	3	49.09	278 12	11.71	+ .08	− .09	
	Σ	2	51.90	285 22	12.28	+ .16	+ .25	V=1867.72
	O Σ	2	57.14	292 26	13.96	− .26	− .01	
	O Σ	2	65.76	304 41	16.64	.00	+ .27	
	Δ	4	66.27	305 0	16.52	+ .21	+ .06	
167	Δ	1	75.43	311 57	19.87	+ .07	− .24	
	Sp	2	76.67	311 45	20.32	− .12	− .53	
	Hl	3	79.61	315 8	21.87	− .06	+ .12	
	Sp	1	83.63	318 2	23.98	− .19	+ .67	
	Hl	3	85.66	318 25	24.30	− .02	+ .08	
	C	3	1903.72	324 54	31.65	+ .09	− .23	

A = − 11.78 − 12.12 T D = + 2.17 + 44.62 T
11.0 0.42

Star	Obs'r	n	Epoch	p_0	s_0	d A	d D	Remarks
Σ 2400	Σ	2	1829.18	305 5	2.96	−0.01	0.00	A, ½ (B + C)
	Σ	2	33.16	302 56	2.74	− .01	+ .05	
168	*O* Σ	1	51.62	275 18	1.77	− .03	− .08	V=1882.53
	O Σ	1	72.61	236 26	1.02	+ .24	+ .56	
	Hl	3	83.77	201 47	2.11	− .02	− .12	

Star	Obs'r	n	Epoch	1850.0		O.—C.		Remarks
				p_0	s_0	dA	dD	
				° ′	″	″	″	
Σ 2400—Con.	Hl	3	1884.62	199 26	2.20	0.00	—0.18	
	Hl	3	85.62	198 16	2.47	— .08	— .39	
	A	3	96.54	186 31	2.66	+ .06	+ .03	
	C	2	97.64	187 22	2.76	— .02	.00	
	C	3	1901.68	184 6	2.84	+ .01	+ .17	
	C	3	03.64	182 16	3.02	+ .03	+ .11	
	C	2	04.83	184 25	2.98	— .11	+ .23	
	C	2	07.59	179 26	3.56	+ .07	— .18	

A = — 1.78 + 3.04 T D = + 0.35 — 6.48 T
12.0 0.82

Star	Obs'r	n	Epoch	p_0	s_0	dA	dD	Remarks
ν Lyrae	OΣ	2	1840.52	123 4	59.26	+0.02	—0.10	
	β	2	79.33	122 19	58.60	— .07	+ .36	
169	OΣ	1	81.37	122 47	58.99	+ .15	— .29	V=1875.41
	C	3	1903.42	122 25	58.69	.00	— .11	

A = + 49.64 — 0.18 T D = — 32.09 + 1.40 T
3.5 0.21

Star	Obs'r	n	Epoch	p_0	s_0	dA	dD	Remarks
Σ 2420	Σ	3	1832.60	346 22	30.27	+0.12	—0.09	
o Draco	Σ	6	36.39	345 28	30.39	— .03	— .07	
	OΣ	2	40.34	345 0	30.59	+ .06	+ .07	V=1862.55
	OΣ	1	51.67	342 47	30.83	— .10	+ .05	
	Δ	3	58.21	341 35	30.80	— .08	— .13	
	Δ	4	63.13	340 48	30.96	— .08	— .10	
170	Δ	3	65.61	340 36	30.93	+ .07	— .14	
	OΣ	2	72.80	339 9	31.60	— .28	+ .36	
	Δ	1	74.56	340 10	31.37	+ .53	+ .24	
	Hl	3	89.54	336 18	31.43	— .07	— .40	
	C	3	1903.72	334 31	32.29	+ .01	+ .07	

A = — 10.00 — 9.34 T D = + 29.13 — 0.61 T
10.0 0.48

Star	Obs'r	n	Epoch	1850.0		O.—C.		Remarks
				p_0	s_0	d A	d D	
				° ′	″	″	″	
11 Aquilae	Σ	3	1831.31	241 32	18.66	−0.01	−0.20	
	Σ	2	51.90	248 37	17.82	− .12	+ .22	
	Δ	8	64.17	252 8	17.36	+ .02	+ .04	V=1864.70
171	OΣ	1	68.75	253 42	16.83	+ .41	+ .14	
	OΣ	1	76.58	256 9	17.06	+ .02	− .08	
	C	3	1903.46	266 9	16.84	− .09	− .09	

A = − 16.45 − 0.47 T
5.0

D = − 6.93 − 11.05 T
0.29

223 Draco	Σ	2	1832.27	123 12	16.63	+0.03	+0.06	
172	Δ	4	67.65	124 7	16.90	− .05	− .10	
	C	3	1903 42	123 54	17.14	+ .03	+ .04	V=1867.78

A = + 13.97 + 0.42 T
3.0

D = − 9.27 − 0.63 T
0.25

31 Aquilae	OΣ	3	1853.99	3 49.0	141.54	−0.14	−0.12	A B
	OΣ	2	62.70	1 30.5	135.26	+ .03	+ .10	
173	OΣ	2	77.58	356 58.2	124.72	+ .19	+ .09	V=1874.50
	C	3	1903.72	346 41.6	108.60	− .10	− .06	

A = + 12.33 − 69.29 T
4.0

D = + 144.21 + 71.60 T
0.14

31 Aquilae	OΣ	3	1853.99	247 35	42.48	− .11	+0.05	B C
	OΣ	2	62.70	248 28	42.44	− .05	− .02	
174	OΣ	2	77.58	250 0	42.20	+ .27	− .06	V=1874.50
	C	3	1903.72	253 19	42.71	− .13	+ .04	

A = − 39.02 − 3.30 T
4.0

D = − 16.57 + 7.96 T
0.14

Star	Obs'r	n	Epoch	1850.0 p_0	1850.0 s_0	O.—C. d A	O.—C. d D	Remarks
				° ′	″	″	″	
21 B Vulpeculae	$O\Sigma$	2	1867.74	120 45	27.56	+0.03	—0.10	
3 Cygni	$O\Sigma$	2	80.58	103 2	26.61	— .06	+ .14	
175	C	3	1902.65	76 19	30.89	+ .01	— .06	V=1883.66

$A = +20.42 + 18.16\,T$ 3.0

$D = -24.86 + 61.20\,T$ 0.06

Star	Obs'r	n	Epoch	p_0	s_0	d A	d D	Remarks
Σ 2521	Σ	3	1829.40	43 28	22.66	+0.10	—0.15	
	Σ	2	51.89	40 54	23.37	— .08	+ .14	
	Δ	4	64.63	40 59	23.70	+ .22	— .16	V=1864.81
176	$O\Sigma$	2	67.74	39 30	23.88	— .12	+ .26	
	$O\Sigma$	1	78.54	38 27	23.72	— 50	— .03	
	C	3	1903.53	37 60	24 81	+ .15	— .09	

$A = +15.39 - 0.50\,T$ 5.5

$D = +17.44 + 4.12\,T$ 0.30

Star	Obs'r	n	Epoch	p_0	s_0	d A	d D	Remarks
Σ 2532	Σ	3	1829.00	4 55	34.92	- 0.08	+0.03	
177	Δ	3	66.90	5 16	34.24	+ .16	— .08	
	C	3	1903.53	4 48	33.74	— .09	+ .03	V=1866.48

$A = +3.03 - 0.22\,T$ 3.0

$D = +34.43 - 1.58\,T$ 0.28

Star	Obs'r	n	Epoch	p_0	s_0	d A	d D	Remarks
σ Draconis	$O\Sigma$	1	1852.69	340 21.3	223.76	+0.05	+0.12	
178	$H\Sigma$	2	84.32	340 48.5	281.56	— .08	— .18	
	C	3	1902.74	341 3.3	315.58	+ .05	+ .10	V=1885.36

$A = -73.81 - 54.39\,T$ 2.5

$D = +205.88 + 175.40\,T$ 0.08

Star	Obs'r	n	Epoch	1850.0 p_0	1850.0 s_0	O.—C. dA	O.—C. dD	Remarks
				° ′	″	″	″	
ϑ Cygni	*O* Σ	1	1852.69	186 8	29.90	−0.05	−0.15	
179	*O* Σ	1	82.62	184 7	37.28	+ .16	+ .32	
	C	3	1902.67	183 36	42.99	− .05	− .10	V=1885.16

A = − 3.15 + 0.95 T D = − 28.88 − 26.45 T

2.0 0.08

Σ 2580	*O* Σ	3	1852.71	145 30.6	161.68	+0.11	+0.02	A C
17 Cygni	*O* Σ	1	59.63	144 59.8	159.01	− .09	.00	
180	*H* Σ	1	83.48	142 57.0	150.11	− .35	− .02	V=1876.00
	C	3	1903.72	140 47.4	143.12	+ .11	+ .02	

A = + 91.50 − 2.11 T D = − 134.46 + 43.86 T

3.0 0.15

α Aquilae	Σ	6	1836.29	322 2.1	152.37	+0.04	−0.08	
	O Σ	15	55.19	317 31.9	153.82	+ .06	+ .21	
	O Σ	1	65.74	314 55.3	155.11	− .25	+ .30	V=1867.37
181	Δ	6	68.07	314 17.8	154.84	− .02	− .21	
	H Σ	1	83.59	310 37.1	157.07	− .06	− .15	
	C	3	1902.66	306 20.9	160.57	+ .07	+ .04	

A = − 101.14 − 53.67 T D = + 115.2[illegible] − 38.21 T

5.0 0.25

Σ 2619	*O* Σ	1	1854.69	291 20	19.06	−0.06	+0.15	½ (A + B), C
	O Σ	1	70.92	296 29	18.00	− .27	− .11	
182	β	2	78.95	300 46	17.10	+ .24	− .06	V=1881.83
	C	3	1903.74	311 55	16.37	− .08	+ .05	

A = − 18.23 + 11.39 T D = + 6.39 + 8.35 T

3.0 0.09

Star	Obs'r	n	Epoch	1850.0 p_0	1850.0 s_0	O.—C. d A	O.—C. d D	Remarks
				° ′	″	″	″	
Σ 2622	$O\Sigma$	2	1853.21	268 40.0	214.67	+0.02	−0.02	A C
15 Sagittae	$O\Sigma$	1	59.60	269 20.9	211.94	+ .22	.00	
183	$O\Sigma$	1	76.77	271 15.1	205.59	— .33	+ .03	V=1875.04
	C	3	1903.72	274 28.6	195.63	+ .06	.00	

A = — 215.85 + 38.62 T D = — 6.26 + 40.08 T
3.0 0.14

Σ 2622	$O\Sigma$	1	1851.80	231 9.1	184.16	+0.15	—0.13	C D
15 Sagittae	$O\Sigma$	1	76.77	231 19.7	184.01	— .29	+ .25	
184	C	2	1903.72	231 11.0	183.67	+ .07	— .06	V=1884.00

A = — 143.58 + 0.75 T D = — 115.40 — 0.61 T A D
2.0 0.09

σ 683	$O\Sigma$	1	1840.84	279 6	60.47	+0.03	+0.09	
185	Doub.	3	78.76	278 41	60.54	— .03	— .12	
	C	1	1903.72	278 48	60.56	+ .04	+ .14	V=1875.52

A = — 59.75 — 0.24 T D = + 9.43 — 0.57 T
2.0 0.10

ω^3 Cygni	$O\Sigma$	1	1840.84	319 44	55.35	0.00	0.00	
186	β	3	1903.21	322 58	56.84	— .12	— .11	
	C	3	03.66	323 19	56.89	+ .12	+ .11	V=1890.92

A = — 35.54 + 2.68 T D = + 42.70 + 5.22 T
2.5 0.16

Star	Obs'r	n	Epoch	1850.0		O.—C.		Remarks.
				p_0	s_0	d A	d D	
				° ′	″	″	″	
β Delphini	β	3	1878.05	116 19	27.66	—0.17	+0.09	½ (A + B), C
	β	4	81.19	115 44	27.57	+ .22	— .19	
187	β	5	89.80	116 53	26.84	+ .27	+ .02	V=1892.86
	β	3	98.49	117 55	25.87	+ .15	+ .04	
	Lewis	2	1902.78	119 50	25.20	— .38	+ .49	β, Gen. Cat.
	C	2	06.83	118 11	24.59	— .12	— .42	

A = + 28.06 — 11.03 T D = + 12.30 — 0.48 T
6.0 0.07

Star	Obs'r	n	Epoch	p_0	s_0	d A	d D	Remarks.
β Delphini	Σ	3	1829.40	343 55	32.50	+0.18	+0.05	½ (A + B), D
	O Σ	2	51.14	339 21	33.68	— .03	— .07	
	Δ	3	64.96	336 28	34.64	— .40	— .04	V=1873.17
188	Δ	2	75.76	335 38	35.27	+ .19	+ .13	
	β	3	81.44	334 20	35.50	— .06	— .09	
	C	2	1902.83	330 46	37.01	— .06	— .18	
	β	3	05.93	330 45	37.51	+ .07	+ .20	

A = — 11.65 — 12.07 T D = + 31.55 + 1.75 T
7.0 0.45

Star	Obs'r	n	Epoch	p_0	s_0	d A	d D	Remarks.
O Σ 533	O Σ	3	1852.02	10 28	10.00	—0.35	—0.10	
κ Delphini	O Σ	2	58.10	2 26	10.02	+ .09	+ .23	
	O Σ	1	65.78	348 22	9.89	— .02	+ .11	V=1878.16
	Δ	3	68.09	345 47	9.41	+ .36	— .40	
	O Σ	2	73.72	337 21	10.51	+ .32	+ .31	
	Δ	3	77.75	328 31	11.06	— .19	+ .15	
189	β	4	78.18	329 20	10.59	+ .31	— .16	
	Hl	2	79.70	325 8	11.41	— .35	+ .13	
	β	5	80.43	326 2	10 94	+ .28	— .14	
	O Σ	2	80.64	323 32	11.40	— .32	— .04	
	β	3	81.44	324 18	11.27	+ .12	— .05	

Star	Obs'r	n	Epoch	1850.0 p_0	1850.0 s_0	O.—C. dA	O.—C. dD	Remarks
				° ′	″	″	″	
κ Delphini—Con.	Hl	2	1884.63	318 51	12.12	−0.32	+0.02	
	Ho	1	90.79	312 18	12.51	+ .26	− .53	
	Hu	3	98.55	306 57	15.02	− .15	+ .27	
	C	3	1902.67	303 16	15.65	+ .01	− .07	

$A = +2.79 - 30.16\,T$ 14.0

$D = +9.98 - 2.52\,T$ 0.25

Star	Obs'r	n	Epoch	p_0	s_0	dA	dD	Remarks
Σ 2708	Σ	2	1829.86	354 30	10.82	+0.11	+0.27	
	Σ	4	34.02	350 11	11.47	− .06	− .01	
	Σ	4	36.89	348 6	12.23	− .13	+ .12	V=1862.23
	O Σ	2	39.86	346 48	12.96	− .03	+ .20	
	O Σ	3	46.69	343 33	14.48	+ .05	+ .16	
	Δ	6	54.74	339 8	15.84	− .08	− .47	
	O Σ	2	54.82	340 32	16.45	+ .09	− .12	
	Δ	8	56.14	339 8	16.35	− .01	− .25	
	Δ	5	58.00	338 25	16.65	+ .01	− .41	
190	Δ	5	63.02	337 9	18.30	− .08	+ .02	
	O Σ	2	67.74	336 15	19.50	+ .02	+ .09	
	Sp	4	76.65	334 23	21.56	+ .13	− .02	
	Hl	2	76.80	333 57	21.76	− .09	+ .06	
	Hl	3	84.70	332 35	23.76	− .07	+ .09	
	Hl	3	86.67	332 53	24.25	+ .18	+ .20	
	Hl	2	87.71	332 8	24.45	− .02	+ .04	
	C	3	1903.72	329 56	28.51	− .04	+ .03	

$A = -4.72 - 17.74\,T$ 17.0

$D = +14.36 + 19.14\,T$ 0.73

Star	Obs'r	n	Epoch	1850.0 p_0	1850.0 s_0	O.—C. d A	O.—C. d D	Remarks
				° ′	″	″	″	
ε Cygni	$O\Sigma$	1	1852.63	338 49	40.69	+0.01	—0.19	
	$O\Sigma$	1	61.63	332 40	39.65	— .05	+ .05	
191	$H\Sigma$	2	83.60	316 42	38.67	+ .03	+ .22	V=1881.14
	C	3	1902.69	302 23	40.10	— .01	— .14	

A = — 13.72 — 38.22 T D = + 39.02 — 33.04 T
3.0 0.11

$O\Sigma$ 413	$O\Sigma$	4	1851.82	105 4	85.42	+0.10	+0.02	½ (A + B), C
λ Cygni	$O\Sigma$	3	62.69	105 8	85.30	+ .03	+ .01	
	$O\Sigma$	3	79.36	105 10	84.96	— .16	+ .14	V=1875.59
192	β	2	80.52	105 24	85.06	— .15	— .24	
	C	3	1903.54	105 18	85.13	+ .15	+ .04	

A = + 82.40 — 0.83 T D = — 22.20 — 0.55 T
5.0 0.16

56 Cygni	$O\Sigma$	1	1852.63	45 10	86.03	—0.16	—0.12	
193	$H\Sigma$	1	83.87	45 42	80.72	+ .40	+ .31	
	C	4	1902.71	45 57	76.42	— .13	— .09	V=1885.48

A = + 61.47 — 12.20 T D = + 61.15 — 15.03 T
2.0 0.08

59 Cygni	Σ	2	1831.86	352 19	20.23	—0.07	—0.06	
194	Δ	3	65.29	352 55	20.38	+ .13	+ .13	
	C	3	1903.54	352 16	20.21	— .07	— .06	V=1866.90

A = — 2.63 — 0.04 T D = + 20.10 — 0.04 T
3.0 0.26

Star	Obs'r	n	Epoch	1850.0 p_0	1850.0 s_0	O.—C. dA	O.—C. dD	Remarks
				° ′	″	″	″	
61 Cygni	$O\Sigma$	39	1853.16	131 56.6	173.20	+0.02	—0.01	½ (A + B), C
195	C	3	1902.73	195 41.4	281.40	— .43	— .16	
	C	3	07.59	198 28.0	301.46	+ .42	+ .14	V=1879.16

A = + 141.85 — 412.87 T D = — 105.90 — 312.42 T
4.0 0.27

Star	Obs'r	n	Epoch	p_0	s_0	dA	dD	Remarks
Σ 2760	Σ	7	1833.06	223 14	13.28	—0.07	—0.23	
	Σ	10	57.08	225 3	10.50	+ .03	+ .21	
	Δ	38	65.62	225 3	9.69	+ .04	+ .13	V=1872.91
	Δ	44	73 94	225 13	8.90	+ .03	+ .08	
196	$O\Sigma$	1	78.64	223 8	8.56	+ .19	— .25	
	Hl	3	79.72	225 15	8.55	— .10	— .11	
	Hl	3	85.70	225 28	7.87	— .03	— .06	
	$H\Sigma$	3	87.80	226 4	7.63	— .05	+ .01	
	C	3	1903.72	226 31	6.08	— .01	— .08	

A = — 7.92 + 6.56 T D = — 8.16 + 7.57 T
7.5 0.33

Star	Obs'r	n	Epoch	p_0	s_0	dA	dD	Remarks
δ Equulei	Σ	3	1829.17	41 18	26.78	+0.32	—0.08	
	Σ	3	32.83	38 16	27.67	.00	+ .49	
	Σ	6	35.39	37 46	27.63	— .08	— .16	V=1853.70
	Σ	5	37.10	37 4	28.16	+ .07	— .05	
	$O\Sigma$	2	44.74	33 28	29.58	— .16	— .07	
197	$O\Sigma$	4	53.27	30 15	31.39	— .18	— .11	
	$O\Sigma$	4	58.12	28 44	32.62	— .04	— .03	
	Δ	4	62.71	27 18	33.56	— .07	— .13	
	Δ	4	63.64	26 55	33.92	— .05	+0.02	
	Δ	5	64.90	26 60	34.32	+ .24	— .01	
	$O\Sigma$	1	65.91	26 12	34.63	+ .01	+ .18	
	C	3	1902.71	17 44	43.74	+ .10	+ .06	

A = + 16.18 — 5.61 T D = + 26.27 + 29.10 T
11.5 0.45

Star	Obs'r	n	Epoch	1850.0 p_0	1850.0 s_0	O.–C. d A	O.–C. d D	Remarks
				° ′	″	″	″	
τ Cygni	$O\Sigma$	4	1852.99	212 59.6	136.91	−0.20	+0.10	½ (A + B), C
	$O\Sigma$	1	66.72	212 14.0	143.03	+ .34	− .03	
198	$O\Sigma$	1	83.87	211 31.4	151.20	+ .43	− .39	V=1877.27
	C	3	1903.52	211 10.6	160.15	− .17	+ .12	

A = − 73.85 − 16.60 T D = − 113.61 − 43.96 T
3.0 0.14

Star	Obs'r	n	Epoch	1850.0 p_0	1850.0 s_0	O.–C. d A	O.–C. d D	Remarks
1 Pegasi	Σ	4	1835.86	311 12	36.20	+0.01	−0.02	
	Σ	1	51.89	311 7	36.36	− .19	+ .01	
	Δ	3	65.83	311 24	36.25	− .02	+ .06	V=1872.10
199	Δ	2	73.10	311 38	36.08	+ .19	+ .05	
	$O\Sigma$	2	76.75	311 0	36.19	− .16	− .18	
	Eng'h	2	87.65	311 52	36.12	+ .22	+ .16	
	C	3	1903.53	311 18	36.23	− .15	− .06	

A = − 27.21 + 0.25 T D = + 23.88 + 0.16 T
6.5 0.28

Star	Obs'r	n	Epoch	1850.0 p_0	1850.0 s_0	O.–C. d A	O.–C. d D	Remarks
μ Cygni	$O\Sigma$	2	1853.26	58 51 6	213.60	+0.08	+0.23	A C
	$O\Sigma$	2	64.18	58 3.5	211.64	+ .07	− .28	
	Δ	4	69.72	57 31.2	211.04	+ .12	+ .05	V=1875.03
200	Δ	5	75.69	56 58.4	210.22	+ .09	+ .19	
	β	3	79.82	56 38.5	208.73	− .61	− .39	
	$O\Sigma$	1	82.61	56 22.0	209.14	.00	+ .16	
	C	3	1903.73	54 32.8	206.42	+ .21	+ .12	

A = + 183.68 − 29.30 T D = + 109.62 − 18.59 T
6.5 0.15

Star	Obs'r	n	Epoch	1850.0 p_0	1850.0 s_0	O.—C. d A	O.—C. d D	Remarks
				° ′	″	″	″	
ϰ Pegasi	Σ	5	1831.56	308 27	11.01	−0.04	0.00	
	Δ	6	64.87	303 58	11.56	+ .07	+ .02	
201	Hl	3	88.82	300 8	12.13	— .05	— .06	V=1872.20
	C	3	1903.54	298 48	12.47	.00	+ .04	

A = — 9.18 — 3.24 T
4.0

D = + 6.62 — 1.23 T
0.30

100 Aquarii	Σ	3	1829.47	185 7	21.65	—0.02	+ .08	
202	Δ	3	66.61	184 39	20.81	+ .03	— .16	
	C	2	1903.56	184 32	19.52	— .02	+ .08	V=1866.55

A = — 1.81 + 0.54 T
3.0

D = — 21.06 + 2.84 T
0.27

OΣ 461	OΣ	3	1846.39	297 24	10.87	+0.09	0.00	A, B.
15 Cephei	OΣ	2	52.22	296 42	10.91	— .03	— .15	
	Win	1	63.85	299 34	11.29	— .13	+ .51	V=1873.01
	Δ	3	66.94	296 54	10.93	— .07	— .12	
203	Δ	3	75.36	298 6	10.89	+ .05	+ .06	
	Hu	3	98.61	299 12	11.13	— .13	+ .33	
	C	2	1903.14	296 45	10.57	+ .13	— .34	

A = — 9.73 + 0.29 T
6.5

D = + 5.05 + 0.10 T
0.28

OΣ 461	Win	1	1863.85	38 19	88.96	—0.45	+0.09	A C
15 Cephei	Eng'h	4	85.92	39 24	89.85	+ .62	+ .06	
	Renz	5	90.5	39 13	89.11	— .21	— .25	V=1891.36
204	Hu	2	99.69	39 28	89.91	+ .26	+ .25	
	C	3	1903.11	39 20	89.25	— .44	— .08	

A = + 55.12 + 3.56 T
4.5

D = + 69.91 — 1.52 T
0.06

Star	Obs'r	n	Epoch	1850.0 p_0	1850.0 s_0	O.–C. dA	O.–C. dD	Remarks
				° ′	″	″	″	
ι Pegasi	$O\Sigma$	3	1852 80	213 15	92.10	+0.27	−0.10	
	$O\Sigma$	1	61.65	214 53	94.19	− .46	+ .01	
205	$O\Sigma$	1	83.82	217 57	98.35	− .39	+ .56	V=1876.08
	C	3	1902.73	219 44	102.71	+ .15	− .17	

A = − 49.92 − 30.12 T D = − 76.83 − 3.78 T
3.0 0.14

Star	Obs'r	n	Epoch	p_0	s_0	dA	dD	Remarks
Σ 2877	Σ	4	1828.95	316 24	7.63	+0.20	−0.10	
	$O\Sigma$	2	51.90	333 42	8.62	− .22	+ .10	
	Δ	7	64.27	342 44	9.02	− .08	− .09	V=1871.85
	Δ	3	66.00	344 39	9.05	+ .06	− .12	
	Δ	3	74.71	349 52	9.62	+ .16	− .14	
206	$O\Sigma$	2	75.79	349 10	10.21	− .36	+ .33	
	β	1	78.62	351 58	10.51	− .04	+ .46	
	$H\Sigma$	2	86.77	356 38	10.57	+ .15	− .11	
	$H\Sigma$	3	91.09	357 56	11.06	+ .02	+ .02	
	C	3	1903.73	363 17	12.01	+ .08	− .14	

A = − 3.75 + 8.12 T D = + 7.47 + 8.69 T
9.5 0.40

Star	Obs'r	n	Epoch	p_0	s_0	dA	dD	Remarks
Σ 2900	Σ	6	1832.70	343 0	56.59	+0.23	−0.11	A C
33 Pegasi	$O\Sigma$	2	39.88	340 44	57.69	+ .03	+ .19	
	$O\Sigma$	3	48.44	337 46	58.49	− .35	− .16	V=1864.15
	Δ	5	63.71	334 5	60.56	+ .16	+ .11	
207	$O\Sigma$	3	71.76	331 44	61.79	− .05	+ .03	
	Hl	3	88.84	327 24	64.60	− .17	− .07	
	C	3	1903.73	324 17	67.16	+ .17	.00	

A = − 22.28 − 31.81 T D = + 54.31 + 0.43 T
7.0 0.41

Star	Obs'r	n	Epoch	1850.0		O.—C.		Remarks
				p_0	s_0	d A	d D	
				° ′	″	″	″	
10 Lacertae	$O\Sigma$	1	1840.83	48 28	61.08	−0.03	+0.19	
	$O\Sigma$	1	68.77	48 50	60.70	— .30	— .28	
208	Doub.	2	78.84	49 6	61.30	+ .24	— .06	V=1878.91
	C	2	1903.10	48 58	61.26	— .09	+ .10	

A = + 45.83 — 0.90 T   D = + 40.29 — 0.31 T
3.0   0.14

$O\Sigma$ 477	$O\Sigma$	3	1846.06	122 43	9.60	−0.09	−0.05	
	Δ	3	67.06	137 41	6.48	— .10	+ .03	
	Δ	2	75.18	148 16	5.54	+ .37	— .02	V=1884.11
	$O\Sigma$	2	75.74	144 7	5.82	— .03	— .02	
	Hl	2	79.74	153 5	5.01	+ .03	+ .16	
209	Hl	3	85.77	164 44	4.63	+ .04	+ .07	
	C	1	93.82	184 43	4.38	— .12	+ .04	
	Hu	2	97.76	192 50	4.58	— .09	— .10	
	Hu	3	98.69	196 50	4.67	— .25	— .13	
	C	3	1903.64	205 39	4.65	— .04	+ .08	
	C	2	06.63	208 21	4.75	+ .23	+ .04	

A = + 7.46 — 17.56 T   D = — 5.08 + 1.52 T
10.5   0.32

Σ 2944	Σ	7	1833.01	157 17	55.70	+0.02	−0.10	A C
	$O\Sigma$	3	52.83	150 42	51.89	— .22	+ .09	
	Δ	4	57.90	148 28	51.36	+ .18	+ .05	V=1866.96
	$O\Sigma$	1	61.63	147 29	50.54	— .27	+ .09	
210	Δ	3	62.68	146 41	50.64	+ .15	+ .07	
	Δ	2	70.05	144 2	49.79	— .10	— .12	
	β	1	77.87	140 51	48.68	— .10	+ .06	
	Hl	2	85.74	137 34	48.24	+ .08	— .12	
	C	3	1903.74	129 45	47.02	— .04	+ .01	

A = + 25.02 — 20.81 T   D = — 46.19 + 29.97 T
8.0   0.32

Star	Obs'r	n	Epoch	1850.0 p_0		s_0	O.—C. dA	dD	Remarks
				°	′	″	″	″	
Arg. 528	$O\Sigma$	2	1853.68	343	19.8	200.56	−0.02	−0.06	
	$O\Sigma$	1	65.91	342	7.2	200.18	+ .03	+ .09	
211	$H\Sigma$	1	83.73	340	18.5	199.59	+ .02	+ .10	V=1877.08
	C	3	1902.74	338	20.4	199.07	− .01	− .05	

A = − 56.31 − 32.54 T D = + 192.73 − 14.56 T
3.0 0.14

Star	Obs'r	n	Epoch	p_0		s_0	dA	dD	Remarks
16 Lacertae	Σ	2	1831.78	344	7	27.57	−0.15	+0.02	A. B.
212	Δ	3	67.71	345	31	27.28	+ .30	− .05	
	C	2	1903.14	345	8	27.37	− .15	+ .03	V=1867.54

A = − 7.26 + 0.73 T D = + 26.47 − 0.07 T
3.0 0.25

Star	Obs'r	n	Epoch	p_0		s_0	dA	dD	Remarks
16 Lacertae	Σ	3	1831.78	47	2	63.56	−0.10	+0.01	A. C.
213	Δ	3	68.64	47	31	63.17	+ .19	− .01	
	C	3	1903.12	47	36	62.42	− .11	+ .01	V=1867.85

A = + 46.69 − 0.58 T D = + 43.00 − 1.73 T
3.0 0.25

Star	Obs'r	n	Epoch	p_0		s_0	dA	dD	Remarks
$O\Sigma$ 536	$O\Sigma$	*	1852.67	86	50.2	259.85	−[0.70]	[−0.38]	p = o
	$O\Sigma$	1	61.66	86	27.1	257.08	.00	+ .14	
214	$H\Sigma$	1	83.73	85	28.6	249.08	+ .07	+ .32	V=1883.78
	Hu	1	1901.66	84	50.1	242.51	+ .07	− .14	
	C	3	03.74	84	42.5	241.52	− .06	− .01	

A = + 261.16 − 38.35 T D = + 14.32 + 14.81 T
2.5 0.08

* Observation of $\Delta\alpha$ and $\Delta\delta$

Star	Obs'r	n	Epoch	1850.0 p_0	1850.0 s_0	O.—C. d A	O.—C. d D	Remarks
				° ′	″	″	″	
β Pegasi	O Σ	1	1852.67	95 27.3	264.21	+0.01	+0.27	
215	O Σ	1	74.72	96 25.6	260.98	— .02	— .48	
	C	3	1903.74	97 23.4	256.70	+ .01	+ .10	V=1883.72

A = + 263.44 — 16.52 T   D = — 24.99 — 15.14 T

2.0   0.09

Star	Obs'r	n	Epoch	p_0	s_0	d A	d D	Remarks
57 Pegasi	Σ	3	1831.05	198 4	32.58	+0.01	0.00	
	Δ	2	66.15	197 49	32.83	+ .06	— .03	
216	β	4	77.78	199 14	32.50	— .36	+ .16	V=1868.34
	C	3	1903.10	196 59	32.61	+ .12	— .04	

A = — 5.14 + 0.50 T   D = — 15.50 — 0.08 T

3.5   0.27

Star	Obs'r	n	Epoch	p_0	s_0	d A	d D	Remarks
60 Pegasi	O Σ	2	1853.72	292 6.3	238.42	+0.06	—0.07	
217	O Σ	1	74.82	293 1.3	235.97	— .21	+ .24	
	C	3	1903.74	294 12.9	231.86	+ .05	— .04	V=1877.95

A = — 221.66 + 18.93 T   D = + 89.39 + 10.70 T

2.5   0.13

Star	Obs'r	n	Epoch	p_0	s_0	d A	d D	Remarks
5 H. Cassiopae	O Σ	2	1852.92	139 52.9	102.37	—0.12	+0.09	
Arg. 540	O Σ	1	68.80	157 55.4	89.70	+ .45	— .17	
218	H Σ	2	83.46	178 11.2	87.35	— .24	— .09	V=1878.44
	C	3	1903.74	202 40.0	100.79	+ .02	+ .07	

A = + 72.05 — 206.36 T   D = — 77.54 — 28.89 T

3.5   0.14

Star	Obs'r	n	Epoch	1850.0 p_0		1850.0 s_0	O.—C. d A	O.—C. d D	Remarks
				°	′	″	″	″	
ψ Aquarii	Σ	4	1836.66	312	11	49.63	—0.20	—0.11	
	Σ	1	51.89	312	52	49.44	+ .41	+ .25	
	Δ	3	64.93	312	11	49.56	.00	— .05	V=1873.50
	Δ	2	73.08	311	57	49.20	+ .16	— .41	
219	Doub.	3	78.83	311	53	49.75	— .25	— .07	
	β	4	80.88	321	37	49.69	+ .22	+ .37	
	Eng'h	2	87.83	312	32	49.98	.00	+ .55	
	C	3	1903.09	311	31	49.43	— .11	— .41	

A = — 36.65 — 0.50 T D = + 33.39 — 0.39 T
7.5 0.28

Star	Obs'r	n	Epoch	p_0		s_0	d A	d D	Remarks
λ Andromedae	O Σ	1	1868.77	93	12.2	222.28	+0.13	+ .29	
220	O Σ	1	82.76	91	57.0	220.24	— .22	— .49	
	C	3	1902.77	89	40.0	218.28	+ .04	+ .10	V=1889.27

A = + 223.78 — 10.52 T D = — 20.38 + 40.85 T
2.0 0.04

Star	Obs'r	n	Epoch	p_0		s_0	d A	d D	Remarks
Σ 3041	Σ	3	1829.86	347	43	71.28	+0.27	—0.02	A, ½ (B + C)
	Σ	2	35.68	347	30	70.89	— .33	— .13	
221	Δ	3	66.18	349	27	69.04	+ .07	+ .27	V=1864.67
	Hl	2	87.88	350	29	67.28	— .04	+ .05	
	C	3	1903.74	351	23	65.99	+ .02	— .16	

A = — 13.93 + 7.50 T D = + 68.51 — 5.81 T
5.0 0.41

Star	Obs'r	n	Epoch	p_0		s_0	d A	d D	Remarks
85 Pegasi	O Σ	1	1851.96	114	3	33.03	—0.09	+0.41	
	O Σ	1	52.67	113	51	32.60	+ .16	— .09	
222	O Σ	1	65.91	92	9	18.89	— .42	— .13	V=1885.54
	O Σ	1	68.77	82	24	17.03	+ .22	+ .07	
	Koües	44	70.00	77	1	16.06	+ .06	+ .20	

Star	Obs'r	n	Epoch	1850.0 p_0	s_0	O.—C. dA	dD	Remarks
				° ′	″	″	″	
85 Pegasi—Con.	$O\Sigma$	1	1874.66	54 24	13.92	—0.07	—0.06	
	$O\Sigma$	1	76.77	40 18	14.02	— .49	+ .33	
	β	4	78.54	33 36	14.40	— .08	— .27	
	Δ	1	78.74	32 48	14.76	+ .12	— .04	
	β	8	79.27	30 24	14.96	+ .11	— .14	
	β	4	80.57	25 0	15.41	+ .06	— .45	
	β	4	81.54	20 48	16.29	+ .04	— .17	
	Big	1	81.88	19 48	16.54	+ .13	— .18	
	$O\Sigma$	1	82.62	15 12	16.98	— .60	— .06	
	β	3	82.77	17 6	17.34	+ .17	— .01	
	Seag	1	83.54	11 18	17.34	—[1.03]	—[.28]	
	$H\Sigma$	3	86.24	7 36	19.84	+ .22	— .23	
	Eng'h	3	86.99	6 6	21.15	+ .46	+ .42	
	β	5	88.67	0 54	21.71	— .07	— .18	
	β	4	89.50	358 42	22.66	— .17	+ .02	
	Lv	2	89.82	358 24	22.70	— .05	— .24	
	β	3	90.52	356 42	23.59	— .16	— .03	
	β	3	91.56	354 42	24.58	— .15	— .06	
	β	8	91.94	354 18	25.02	— .02	.00	
	Lewis	1	95.06	350 0	28.86	+ .32	+ .50	
	A	3	95.69	348 42	29.27	+ .14	+ .35	
	A	2	96.75	347 48	30.48	+ .40	+ .18	
	A	2	97.56	346 6	31.49	— .02	+ .12	
	β	2	97.82	345 42	31.74	— .02	+0.04	
	β	3	98.49	344 24	32.53	— .32	— .08	
	A	2	98.69	344 27	32.90	— .21	+ .08	
	C	3	1902.73	341 19	37.64	+ .08	— .16	

$A = +32.30 - 83.50\,T$ $D = -15.66 + 97.89\,T$

2.5   0.33

TABLE III.

Adopted Positions and Proper Motions of the Comparison Stars.

No.	Name	R. A. 1850.0	Precession	Sec Var	μ
		h m s	s	s	s
1	Arg. 559	23 58 50.21	306.78	+ 1.81	+ 2.90
2	Σ 23	0 9 47.70	307.09	0.22	+ 0.07
3	σ 6	12 10.34	312.57	2.49	− 1.18
4	42 Piscium	14 40.12	309.06	0.95	+ 0.40
5	49 Piscium	23 0.00	310.78	1.14	− 0.17
6	Σ 42	28 3.45	316.26	+ 2.10	+ 1.31
7	54 Piscium	31 34.06	313.98	1.48	− 3.28
8	Σ 80	51 42.35	307.13	0.46	− 0.26
9	σ^2 Piscium	57 56.94	327.54	2.49	+ 0.05
10	ϑ Cassiopeiae	1 2 0.12	356.95	5.87	+ 2.60
11	Σ 125	19 18.34	306.41	+ 0.54	+ 1.86
12	Σ 132 *seq*	23 58.58	321.04	1.49	+ 0.79
13	Σ 142	31 52.45	320.62	1.42	− 0.26
14	107 Piscium	34 21.76	326.12	1.69	− 2.08
15	16 Persei	2 41 7.98	373.93	3.34	+ 1.33
16	7 Tauri	3 25 34.14	353.56	+ 1.80	+ 0.07
17	40, *o*, Persei	32 52.85	377.95	2.47	+ 0.13
18	43 Persei	45 28.63	440.99	4.43	+ 0.99
19	39 Tauri	56 27.90	352.56	1.52	+ 1.16
20	*O* Σ 531	57 35.28	395.98	2.58	+ 1.50
21	φ Tauri	4 11 8.18	367.68	+ 1.65	− 0.19
22	13 Orionis	59 25.35	328.23	0.60	− 0.02
23	111 Tauri	5 15 40.41	347.85	0.64	+ 1.64
24	ϑ^1 Orionis	27 54.50	294.41	0.41	+ 0.00
24 bis	ϑ^2 Orionis	28 0.99	294.35	0.41	+ 0.06
25	South 503	47 28.98	340.21	0.22	+ 2.64

Dec. 1850.0			Precession	Sec. Var	μ'	Mag.	Name
°	′	″	″	″	″		
+ 28	11	37.8	+ 2005.1	− 0.6	− 18.8	6.4	Arg. 559
− 0	31	1.4	2003.3	2.8	+ 11.0	7.6	Σ 23
+ 37	24	20.5	2002.3	3.2	− 27.2	7.1	σ 6
+ 12	38	56.1	2001.0	3.7	+ 3.2	6.4	42 Piscium
+ 15	12	29.3	1995.0	5.4	+ 2.0	7.1	49 Piscium
+ 29	10	58.4	+ 1990.1	− 6.5	− 40.5	7.9	Σ 42
+ 20	26	26.1	1986.1	7.0	− 37.4	6.1	54 Piscium
− 0	1	39.5	1954.3	10.8	− 10.7	7.0	Σ 80
+ 31	22	39.0	1941.3	12.8	− 1.8	6.5	σ² Piscium
+ 54	21	1.7	1932.2	14.9	− 1.7	4.6	ϑ Cassiopeiae
− 0	55	25.4	+ 1886.3	− 16.2	− 34.4	7.9	Σ 125
+ 16	10	51.7	1872.0	17.6	− 20.4	7.1	Σ 132 *seq*
+ 14	29	38.4	1846.2	19.0	− 2.0	8.2	Σ 142
+ 19	32	13.8	1837.5	19.6	− 67.1	5.6	107 Piscium
+ 37	41	49.6	1529.6	36.2	− 10.2	4.5	16 Persei
+ 23	57	25.5	+ 1251.2	− 40.8	− 3.1	6.1	7 Tauri
+ 33	28	44.8	1200.6	44.6	− 1.0	5.2	40, *o*, Persei
+ 50	15	18.7	1110.5	54.2	− 12.8	5.5	43 Persei
+ 21	35	58.6	1029.2	44.8	− 13.8	6.2	39 Tauri
+ 37	40	27.6	1020.8	50.5	− 21.5	7.2	*O* Σ 531
+ 26	59	13.4	+ 917.0	− 48.0	− 7.8	5.1	φ Tauri
+ 9	17	2.5	523.8	46.4	− 38.3	6.4	13 Orionis
+ 17	14	20.1	385.4	50.4	− 0.5	5.3	111 Tauri
− 5	29	35.1	279.8	42.6	+ 1.3	4.4	ϑ¹ Orionis
− 5	31	8.9	278.9	42.6	+ 1.0	4.9	ϑ² Orionis
+ 13	54	54.0	109.5	50.6	− 48.0	6.6	South 503

No.	Name	R. A. 1850.0			Precession	Sec Var	μ
		h	m	s	s	s	s
26	15 Geminorum	6	18	50.14	357.95	— 0.07	— 0.23
27	O Σ 154		33	46.83	421.16	0.77	— 0.14
28	29 Monocerotis	8	1	3.22	302.00	0.31	— 0.14
29	Arg. 167		2	13.84	381.68	1.95	— 3.65
30	Camelop. 176		4	2.21	678.73	17.65	+ 0.09
31	Br. 1169		4	31.69	502.50	— 6.46	— 0.03
32	σ 294		14	32.42	409.07	3.00	+ 0.03
33	Σ 1263		35	15.42	401.70	3.31	— 2.65
34	75 Cancri		59	57.24	355.82	1.95	— 0.93
35	81 π Cancri	9	4	4.73	333.05	1.14	— 3.64
36	σ 331		6	30.70	348.01	— 1.71	— 0.90
37	41 Lyncis		18	48.65	397.47	4.29	— 0.05
38	6 Leonis		23	54.84	322.55	0.92	+ 0.05
39	7 Leonis		27	40.69	329.20	1.18	— 0.16
40	9 Sextantis		46	16.09	314.43	0.67	— 0.30
41	σ 362	10	15	27.02	313.80	— 0.65	— 1 65
42	Σ 1472		39	3.71	318.52	0.98	— 0.15
43	σ 377	11	2	5.40	385.25	10.12	+ 0.12
44	Σ 1516		5	15.99	419.53	17.28	— 9.50
45	Σ 1517		5	47.81	319.14	1.32	— 2.76
46	81 Leonis		17	46.83	314.76	— 1.00	— 0.98
47	61 Ursae Majoris		33	8.40	318.10	2.20	— 0.02
48	62 Ursae Majoris		33	45.24	316.90	1.94	— 2.78
49	Σ 1607	12	3	58.29	305.40	2.01	— 0.44
50	Σ 1658		27	29.26	304.82	0.08	+ 1.06
51	Σ 1678		37	55.35	301.17	— 0.36	— 0.42
52	33 Virginis		38	45.28	303.02	0.12	+ 1.86
53	Σ 1682		43	34.92	311.38	+ 0.93	— 0.04
54	42 Comae	13	2	41.40	295.18	— 0.34	— 3.07
55	σ 434		7	5.11	314.33	+ 1.11	— 1.56

Dec. 1850.0			Precession	Sec Var	μ′	Mag.	Name
°	′	″	″	″	″		
+ 20	52	33.9	— 164.6	— 51.8	— 5.2	6.6	15 Geminorum
40	46	15.3	294.5	60.5	— 16.0	6.9	O Σ 154
— 2	33	3.5	1010.5	37.5	+ 1.2	4.5	29 Monocerotis
+ 32	55	25.2	1019.4	46.6	— 65.8	7.0	Arg. 167
72	51	51.9	1033.0	84.2	— 3.3	6.1	Camelop 176
+ 59	38	28.0	— 1036.6	— 62.2	— 3.7	6.7	Br. 1169
42	28	58.4	1110.6	49.2	+ 0.2	6.1	σ 294
42	14	11.2	1256.8	44.5	— 65.0	7.6	Σ 1263
27	14	47.3	1417.6	35.9	— 39.1	6.2	75 Cancri
15	35	50.6	1442.8	32.3	+ 23.5	6.6	81 π Cancri
+ 24	0	0.3	— 1457.5	— 34.0	— 16.1	8.4	σ 331
46	15	19.3	1529.3	36.8	— 13.0	5.5	41 Lyncis
10	22	27.6	1557.8	28.9	— 1.4	5.3	6 Leonis
15	2	46.3	1578.3	28.9	— 0.5	6.6	7 Leonis
5	38	58.3	1673.3	24.5	+ 0.2	6.8	9 Sextantis
+ 6	27	11.8	— 1800.1	— 19.2	— 7.6	6.8	σ 362
13	49	15.4	1881.4	15.2	— 7.0	7.8	Σ 1472
66	50	33.2	1941.5	12.8	+ 3.2	(8.4)	σ 377
74	17	10.7	1948.2	12.9	+ 10.7	8.1	Σ 1516
20	56	57.8	1949.3	10.1	— 14.1	7.1	Σ 1517
+ 17	16	49.6	— 1971.2	— 7.5	— 1.7	5.9	81 Leonis
35	2	55.0	1991.4	4.6	— 38.4	5.6	61 Ursae Majoris
32	34	34.3	1992.0	— 4.3	+ 2.2	6.0	62 Ursae Majoris
36	55	25.8	2004.8	+ 1.6	+ 1.2	7.8	Σ 1607
8	16	25.7	1990.7	6.2	— 9.3	8.0	Σ 1658
+ 15	11	41.9	— 1977.7	+ 8.0	+ 0.4	6.3	Σ 1678
+ 10	22	46.3	1976.5	8.4	— 46.6	5.7	33 Virginis
— 9	31	13.7	1969.0	9.4	— 2.3	6.7	Σ 1682
+ 18	19	27.6	1930.6	12.2	+ 12.4	4.5	42 Comae
— 10	33	39.0	1919.8	13.9	— 31.0	6.9	σ 434

No.	Name	R. A. 1850.0	Precession	Sec. Var.	μ
		h m s	s	s	s
56	72 Virginis	13 22 36.49	311.84	+ 0.90	+ 0.18
57	18 Librae	14 50 47.22	324.00	1.28	− 0.72
58	5 Serpentis	15 11 39.56	303.09	0.80	+ 2.50
59	39 Serpentis	46 13.12	280.01	0.33	− 1.14
60	Σ 1993	53 0.52	270.63	0.40	− 0.06
61	σ 502	54 49.41	249.95	+ 0.30	− 0.68
62	ρ Coronae	55 18.67	230.69	0.29	− 1.67
63	49 Serpentis	16 6 19.01	277.98	0.51	+ 1.17
64	O Σ 311	21 16.04	259.94	0.36	− 0.15
65	41 Herculis	37 41.86	293.15	0.55	− 1.50
66	43 Herculis	38 37.96	287.60	+ 0.47	− 0.03
67	19 Ophiuchi	39 36.22	302.01	0.57	− 0.26
68	Σ 2120	58 48.88	237.72	0.31	− 0.13
69	54 Ophiuchi	17 27 27.66	275.94	0.31	+ 0.21
70	70 Ophiuchi	57 52.65	301.21	+ 0.35	+ 1.51
71	B, D. 64° 1253	18 13 35.51	24.83	− 0.08	− 0.51
72	Σ 2322	22 38.22	297.91	+ 0.08	− 0.14
73	29 Scuti	23 6.58	332.74	− 0.07	+ 0.00
74	Σ 2396	41 24.10	282.52	+ 0.11	+ 0.74
75	Σ 2400	42 11.22	269.24	0.09	− 0.23
76	ν Lyrae	44 16.95	223.95	0.14	− 0.33
77	11 Aquilae	52 11.50	276.05	+ 0.06	− 0.04
78	223 Draconis	55 46.61	61.34	− 0.83	− 0.34
79	Σ 2521	19 19 55.03	262.42	+ 0.05	− 0.24
80	Σ 2532	22 38.55	301.47	− 0.19	− 0.16
81	σ Draconis	32 38.46	− 19.94	− 1.82	+ 10.09
82	17 Cygni	40 44.07	+ 227.43	+ 0.12	+ 0.06
83	Σ 2619	56 35.90	178.18	− 0.05	− 1.22
84	15 Sagittae	57 21.94	272.25	+ 0.02	− 2.79
85	σ 683	20 26 15.39	184.79	+ 0.03	− 0.14

Dec. 1850.0	Precession	Sec. Var.	μ'	Mag.	Name
° ′ ″	″	″	″		
− 5 41 39.5	− 1876.3	+ 16.8	+ 1.3	6.1	72 Virginis
− 10 32 15.4	1473.7	32.6	− 8.6	5.9	18 Librae
+ 2 20 10.9	1343.9	33.9	− 52.3	5.2	5 Serpentis
13 40 11.0	1105.1	34.2	− 58.1	6.4	39 Serpentis
17 48 17.6	1055.1	34.0	+ 0.8	8.2	Σ 1993
+ 26 35 41.9	− 1041.5	+ 31.5	+ 3.0	(7.5)	σ 502
33 45 32.4	1037.9	28.7	− 77.6	5.6	ρ Coronae
13 55 52.9	954.3	36.3	− 42.5	6.9	49 Serpentis
21 14 17.3	837.3	34.8	− 11.1	(7.9)	O Σ 311
6 22 48.6	704.7	39.9	− 28.2	6.8	41 Herculis
+ 8 51 36.5	− 697.0	+ 39.6	+ 3.1	5.1	43 Herculis
2 20 21.1	689.0	41.6	− 1.4	6.4	19 Ophiuchi
28 18 2.3	529.0	33.6	+ 0.1	7.3	Σ 2120
13 16 4.4	283.7	39.8	− 4.2	6.7	54 Ophiuchi
2 32 20 5	− 18.6	44.4	− 110.8	4.1	70 Ophluchi
+ 64 42 2.1	+ 118.8	+ 3.6	+ 4.1	7.4	B, D. 64° 1253
3 58 11.9	197.7	43.1	− 1.9	6.9	Σ 2322
− 10 53 39.1	201.8	48.2	− 1.8	6.0	29 Scuti
+ 10 36 6.0	360.2	40.6	− 50.4	7.7	Σ 2396
16 5 21.9	367.0	38.4	+ 4.6	8.1	Σ 2400
+ 32 22 51.9	+ 385.0	+ 31.8	+ 0.3	5.4	ν Lyrae
13 25 35.4	452.7	39.0	− 12.8	5.4	11 Aquilae
62 11 39.8	483.2	8.4	− 3.6	6.8	223 Draconis
19 35 48.8	685.1	35.5	− 8.3	6.0	Σ 2521
2 35 48.1	707.4	40.8	+ 0.3	6.3	Σ 2532
+ 69 24 21.4	+ 788.6	− 0.4	− 176.1	4.9	σ Draconis
33 22 53.7	853.2	+ 29.7	− 45.0	5.1	17 Cygni
47 50 50.5	976.6	22.3	− 10.8	8.1	Σ 2619
16 40 2.5	982.5	33.4	− 40.8	6.0	15 Sagittae
48 42 33.6	1194.5	21.1	− 0.5	6.9	σ 683

No.	Name	R. A. 1850.0	Precession	Sec. Var.	μ
		h m s	s	s	s
86	ω^3 Cygni	20 26 41.06	185.03	+ 0.04	+ 0.10
87	Σ 2708	33 0.16	224.78	0.26	+ 1.57
88	56 Cygni	44 45.33	211.69	0.28	+ 1.23
89	Σ 2760	21 0 39.39	244.68	+ 0.55	− 0.14
90	δ Equulei	7 10.51	291.99	− 0.10	+ 0.29
91	μ Cygni	37 26.24	265.61	+ 0.58	+ 2.18
92	100 Aquarii	46 47.92	312.28	− 0.59	− 0.06
93	15 Cephei	59 0.83	194.69	+ 0.86	+ 0.32
94	Σ 2877	22 7 6.19	288.47	0.34	− 0.72
95	33 Pegasi	16 26.66	285.79	0.54	+ 2.38
96	O Σ 477	36 57.47	259.36	+ 1.72	+ 1.66
97	Σ 2944	40 6.07	311.14	− 0.47	− 1.28
98	Arg. 528	43 56.25	296.95	+ 0.41	+ 2.94
99	16 Lacertae	49 33.34	272.22	1.72	+ 0.03
100	O Σ 536	50 59.01	301.17	0.25	+ 2.59
101	57 Pegasi	23 1 57.31	302.51	+ 0.26	− 0.01
102	60 Pegasi	4 32.75	291.49	1.14	− 1.45
103	Σ 3041, B C	40 13.92	303.79	0.93	+ 0.52
104	85 Pegasi	54 20.65	305.51	1.68	+ 6.24

Dec. 1850.0	Precession	Sec. Var.	μ'	Mag.	Name
° ′ ″	″	″	″		
+ 48 42 57.8	+ 1197.5	+ 21.2	− 3.3	5.5	ω^3 Cygni
38 7 4.7	1241.4	25.2	− 18.3	7.0	Σ 2708
43 29 47.4	1320.5	23.0	+ 13.2	5.2	56 Cygni
33 32 1.6	1421.9	24.6	− 4.0	9.2	Σ 2760
9 24 6.6	1461.5	28.4	− 31.0	4.7	δ Equulei
+ 28 4 2.0	+ 1629.5	+ 22.2	− 24.7	4.7	μ Cygni
− 4 0 21.9	1675.9	24.3	+ 0.2	6.2	100 Aquarii
+ 59 5 19.2	1732.2	13.7	− 1.0	6.9	15 Cephei
16 27 4.2	1766.7	19.0	− 9.8	6.6	Σ 2877
20 5 30.9	1803.9	17.7	− 1.6	6.5	33 Pegasi
+ 45 14 28.9	+ 1874.9	+ 12.6	− 0.6	7.5	*O* Σ 477
− 5 0 20.7	1884.5	14.6	− 30.5	7.0	Σ 2944
+ 13 10 2.9	1895.7	13.6	+ 21.0	(7.9)	Arg. 528
40 48 15.4	1911.1	11.2	+ 0.1	5.8	16 Lacertae
8 33 40.6	1914.9	12.4	− 15.2	6.6	*O* Σ 536
+ 7 51 54.8	+ 1941.1	+ 10.2	+ 0.5	5.0	57 Pegasi
26 2 17.2	1946.7	9.2	− 12.1	6.4	60 Pegasi
16 14 32.0	1997.6	3.0	− 6.4	8.1	Σ 3041, B C
26 17 17.2	2004.5	0.3	− 98.5	6.0	85 Pegasi

TABLE IV

Comparison Star Weights and Residuals

	Star Catalogue	Epoch	R. A. p	R. A. O—C	Dec. p	Dec. O—C
				s		"
	Br	53.0 54.2	0.6	0.00	0.4	+ 0.1
	Pi	1800.	1.	.00	0.5	− 1.7
	C Ab	30.	2.5	+ .06	2.	+ 0.2
1	Pu M	66.2	4.	− .10	4.	− 0.2
	Gh 80	83.1	8.	.00	5.	+ 0.5
	Ci	89.8	1.5	+ .12	1.	− 0.5
	Gh 90	92.5	5.	− .05	2.	+ 0.2
	Ci	99.8	1.5	+ .08	1.	− 0.8
	Flint	1903.8	5.	− .03	2.5	− 0.1
	Weights	*1877.1* *1873.8*	*29.1*	*2.71*	*18.4*	*1.69*
	P M	1825.9	0.5	− 0.12	0.5	− 1.6
	Ya	69.9 67.4	2.	.00	1.	+ 1.6
2	Rbg	76.3	4.	+ .05	4.	+ 0.2
	A G	83.9	1.	− .05	1.	− 0.7
	Flint	1903.8	5.	− .01	2.5	− 0.3
	Weights	*1884.9* *1881.0*	*12.5*	*0.44*	*9.0*	*0.31*
	P M	1823.4	2.5	+ 0.01	2.	0.0
3	Ya	72.8 79.9	2.5	− .04	1.	+ 0.2
	Ci	89.6	1.5	+ .09	1.	0.0
	Flint	1903.8	5.	.00	2.5	0.0
	Weights	*1877.8* *1872.5*	*11.5*	*1.10*	*6.5*	*0.75*

Star	Catalogue	Epoch	R. A. p	R. A. O—C	Dec. p	Dec. O—C
				s		″
4	Br	1754.2	0.8	+ 0.04	0.4	+ 0.4
	Pi	1800.	1.	— .06	0.5	— 0.6
	P M	31.4	2.	.00	1.2	0.0
	Tay D	35.8 35.0	0.5	+ .11	0.4	+ 1.1
	Pu M	42.4	4.	— .01	4.	0.0
	Pa	49.9	2.5	.00	1.	— 0.1
	Rbg	75.1	4.	+ .01	4.	+ 0.1
	Ci	99.2	3.	.00	1.	0.0
	Gh 1900	1901.2 02.1	2.	— .01	1.5	— 0.1
	Weights	*1857.6* *1857.6*	*19.8*	*2.49*	*14.0*	*2.49*
5	Br	1754.2	0.5	+ .11	0.3	— 4.3
	Pi	1800.	0.5	+ .02	0.3	+ 1.4
	P M	28.2	2.5	+ .01	2.	+ 0.2
	Pu M	49.0	5.	— .01	5.	0.0
	A G	70.0	1.	— .02	1.	+ 1.0
	Wash	73.7	3.	— .08	1.	+ 0.5
	Rbg	75.2	4.	.00	4.	— 0.2
	Flint	1903.8	5.	+ .04	2.5	— 0.7
	Weights	*1865.3* *1861.6*	*21.5*	*2.12*	*16.1*	*1.29*
6	P M	1823.8	2.5	+ 0.02	2.	— 0.1
	A G	73.8	1.	+ .02	1.	+ 0.3
	Rbg	77.2	4.	— .04	4.	+ 0.1
	Flint	1903.8	5.	+ .02	2.5	— 0.1
	Weights	*1876.9* *1872.8*	*12.5*	*1.06*	*9.5*	*0.73*

	Star Catalogue	Epoch	R. A. p	R. A. O—C	Dec. p	Dec. O—C
	Br	1754.9 54.2	0.7	s — 0.06	0.4	″ — 0.6
	C Ab	1830.	4.	+ .03	2.5	+ 0.3
7	Pu M	50.6	4.	— .03	4.0	— 0.1
	Glasgow	91.9	2.	+ .12	1.0	+ 0.2
	Flint	1903.8	4.	— .05	2.5	— 0.1
	Weights	*1860.5* *1858.7*	*14.7*	*2.11*	*10.4*	*1.31*
	P M	1824.2	2.5	+ .01	2.0	— 0.2
	Rbg	75.3	4.	— .01	4.	+ 0.5
8	A G	82.4 80.9	1.	— .08	1.	— 0.5
	Ci	95.4	2.	+ .10	1.	— 0.6
	Flint	1903.8	5.	+ .01	2.5	— 0.1
	Weights	*1879.5* *1874.8*	*14.5*	*1.11*	*10.5*	*0.77*
	Br	1756.0	0.5	— .06	0.3	+ 0.3
	Pi	1800.	1.	— .12	0.5	— 0.3
	P M	24.4	2.	+ .09	1.2	+ 0.4
9	Tay D	35.7 35.0	0.5	+ .06	0.1	+ 0.7
	Pa	44.1	2.	+ .01	1.	— 1.0
	Rbg	75.4	4.	— .02	4.	+ 0.1
	Ci	1900.2	3.	.00	1.	0.0
	Weights	*1856.5* *1857.6*	*13.0*	*1.78*	*8.1*	*0.95*
	Br	1753.6 51.4	0.6	+ 0.14	0.7	— 0.4
10	Gr	1807.1 11.0	0.3	— .12	1.0	+ 0.5
	C Ab	30.	3.5	.00	2.0	+ 0.3
	Pu M	55.	4.	— .07	4.0	— 0.2

Star	Catalogue	Epoch	R. A. p	R. A. O—C	Dec. p	Dec. O—C
10 cont	Gh 80	85.1	3.	s + .12	1.5	″ — 0.6
	Ci	95.4	1.	+ .00	1.0	— 1.0
	Flint	1903.8	5.	— .02	2.5	+ 0.6
Weights		*1867.1* *1858.3*	*17.4*	*2.28*	*12.7*	*1.94*
11	P M	1825.8	1.5	— 0.00	1.2	+ 0.2
	Pa	44.8	0.5	+ .09	0.5	— 2.1
	Rbg	75.3	3.	— .11	4.	+ 0.2
	A G	84.3	1.	+ .03	1.	+ 0.2
	Wash	86.3	5.	+ .01	1.5	+ 0.6
	Flint	1903.8 04.5	6.	+ .01	3.0	— 0.5
Weights		*1885.7* *1878.7*	*17.0*	*0.81*	*11.2*	*9.61*
12	Br	1754.3	0.3	— 0.08	....	....
	P M	1842.6	1.5	+ .04	1.2	+ 1.6
	Pu M	58.2	6.	+ .01	6.0	— 0.4
	Gh 80	79.2	3.	— .03	2.0	— 0.1
	Ci	89.9	1.	— .04	1.	+ 0.4
	Flint	1904.6	6.	+ .01	3.	+ 0.1
Weights		*1876.1* *1872.9*	*17.8*	*1.32*	*13.2*	*0.59*
13	P M	1835.3	2.	+ .01	1.5	— 0.1
	A G	69.4	1.	— .02	1.	+ 0.1
	Yarnall	73.2 70.4	3.	+ .02	1.	+ 1.3
	Rbg	75.2	4.	— .03	4.	— 0.4
	Flint	1904.8	5.	+ .01	2.5	0.0
Weights		*1879.0* *1875.5*	*15.0*	*0.78*	*10.0*	*0.45*

Star	Catalogue	Epoch	R. A. p	R. A. O.—C.	Dec. p	Dec. O.—C.
				s		″
14	Br	1754.9 54.6	1.1	— .04	0.5	— 0.5
	C Ab	1830.	4.5	+ .02	2.5	+ 0.2
	Pu M	45.9	4.	+ .01	4.	0.0
	Gh 80	84.2	3.	— .02	1.5	0.0
	Ci	95.9	1.5	+ .00	1.	— 0.4
	Flint	1904.6	5.	+ .01	2.5	0.0
	Weights	*1862.2* *1860.0*	*19.1*	*3.04*	*12.0*	*1.56*
15	Br	1754.4 54.3	0.0	— 0.49	0.4	+ 0.4
	Pi	1800.	0.7	+ .03	0.4	+ 1.6
	C Ab	30.	3.5	— .03	2.	+ 0.1
	Pu M	50.5	5.	+ .02	5.	— 0.8
	Wash	75.8	4.	.00	1.5	+ 1.5
	Ci	89.3	1.5	+ .02	1.	+ 0.4
	Flint	1905.5	1.	+ .03	0.5	— 0.2
	Weights	*1857.3* *1850.8*	*15.7*	*1.03*	*10.8*	*.81*
16	Br	1755.2 55.5	0.7	— 0.05	0.4	+ 1.6
	Pi	1800.	0.	— .37	0.4	+ 0.4
	P M	24.2	2.	+ .07	1.5	— 0.4
	Pu M	43.9	4.	— .04	4.	— 0.2
	Gh 80	81.6	3.	+ .06	3.	— 0.1
	Gh 90	94.0	7.	.00	4.	+ 0.3
	Flint	1904.6	6.	— .02	3.	0.0
	Weights	*1875.9* *1869.3*	*22.7*	*2.73*	*16.3*	*1.93*

	Star Catalogue	Epoch	R. A.		Dec.	
			p	O—C	p	O—C
				s		″
17	Br	1755.5 54.0	0.6	+ .06	0.2	+ 1.3
	Pi	1800.	0.7	+ .05	0.4	— 1.1
	P M	33.7	1.5	+ .01	1.	+ 0.1
	Tay D	34.4	0.6	— .09	0.4	+ 1.4
	Pa	48.4	1.5	+ .02	1.	— 1.6
	Pu M	49.7	4.	— .07	4.	+ 0.2
	A G	74.0	1.5	+ .08	1.	— 0.2
	Ci	1901.0	3.	+ .02	1.	+ 0.4
	Weights	*1854.5* *1851.2*	*13.4*	*1.57*	*9.0*	*0.62*
18	Br	1754.	0.6	— 0.22	0.6	+ 1.5
	P M	1830.	2.	+ .08	2.	— 0.5
	C Ab	30.	3.	+ .08	2.	— 0.4
	Armagh	40.	2.	— .08	2.	— 0.1
	Pa	45.	1.	+ .05	1.	+ 1.2
	Radcliffe	45.	2.	+ .02	1.	— 0.3
	Pu M	55.	4.	.00	4.	+ 0.1
	Radcliffe	60.	2.	— .02	1.	+ 0.7
	Gh 64	64.	2.	— .07	1.5	+ 0.7
	Rbg	75.	6.	— .03	5.	— 0.1
	Gh 90	90.	5.	— .07	2.	+ 0.0
	Weights	*1857.* *1853.*	*29.6*	*1.83*	*22.1*	*1.41*
19	Br	1755.2 55.8	0.	— .27	0.	— 8.5
	Pi	1800.	1.	— .05	0.5	+ 0.1
	C Ab	30.	2.5	+ .02	2.	0.0
	Pu M	43.9	4.	— .01	4.	+ 0.1

Star	Catalogue	Epoch	R. A. p	R. A. O—C	Dec. p	Dec. O—C
19 cont.	Gh 80	80.	5.	+ .02 s	3.	− 0.2 ″
	Flint	1904.5	5.	− .01	3.	+ 0.1
Weights		*1867.0* *1863.1*	*17.5*	*1.78*	*12.5*	*1.16*
20	C Ab	1830.	4.0	− .02	2.	− 0.2
	Tay D	36.5	0.6	+ .08	0.4	0.0
	Rbg	76.7	3.	+ .01	3.	+ 0.3
	Ci	90.0	1.5	+ .02	1.	− 0.1
	Gh 90	96.5	4.	+ .01	2.	0.0
	Flint	1904.5	6.	− .01	3.	− 0.1
Weights		*1879.6* *1879.1*	*19.1*	*1.62*	*11.4*	*0.81*
21	Pi	1800.	0.	+ 0.39	0.4	− 1.6
	P M	23.6	2.	+ .02	1.5	+ 0.1
	Pu M	49.2	4.	− .01	4.0	+ 0.8
	Gh 80	78.6	5.	− .02	2.5	− 0.1
	Gh 90	95.4	5.	+ .04	2.	− 0.6
	Flint	1904.6	6.	− .02	3.	− 0.1
Weights		*1879.1* *1869.6*	*22.0*	*1.49*	*13.4*	*1.21*
22	Br	1754.8 55.0	0.9	− 0.02	0.4	+ 1.1
	Pi	1800.	2.	+ .07	0.5	− 1.8
	C Ab	30.	2.5	− .08	2.	− 0.8
	Pu M	50.2	5.	+ .01	5.	+ 0.6
	Ci	91.0	1.5	− .00	1.	+ 0.1
	Flint	1904.4	5.	+ .01	2.5	− 0.2
Weights		*1855.8* *856.61*	*16.9*	*3.09*	*11.4*	*1.45*

	Star Catalogue	Epoch	R. A. p	R. A. O—C	Dec. p	Dec. O—C
				s		″
	Br	1755.	0.7	.00	0.4	— 0.7
	P M	1830.	2.	— .02	1.2	— 1.1
	Armagh	40.	0.5	+ .07	2.	— 0.3
	Pa	45.	....	....	1.	+ 0.9
	Gh 50	50.	2.	+ .06	1.2	+ 0.5
	Pu M	55.	4.	— .01	4.	+ 0.5
23	Gh 60	60.	0.8	— .04	1.	— 0.2
	Radcliffe	60.	2.	— .06	1.5	— 0.2
	Gh 64	64.	2.	+ .08	1.5	+ 0.2
	Gh 72	72.	2.	+ .02	2.5	+ 0.1
	Rbg	75.	4.	+ .04	4.	— 0.3
	Wash	75.	4.	— .03	1.2	+ 0.8
	Gh 80	80.	5.5	+ .05	2.5	— 0.3
	Gh 90	90.	5.	+ .02	5.	— 0.4
	Glasgow	90.	3.	+ .02	2.	+ 0.1
	Weights	*1869.* *1867.*	*37.5*	*1.86*	*31.0*	*1.41*
	Br	1755.5 54.1	0.8	+ 0.03	0.1	+ 0.2
	Pi	1800.	0.8	+ .06	0.4	+ 0.3
	P M	32.	2.5	.00	2.	— 0.3
	Tay D	34.8	....	....	0.7	— 0.3
24	Gh 40	38. 47.	2.	— .07	1.	+ 1.5
	Pa	48.2 47.1	2.5	— .02	1.	— 1.1
	Gh 80	83.0	3.	— .01	1.	+ 0.7
	Wash	84.2	5.	+ .05	1.5	+ 1.2
	Pu	85.0	6.	— .01	....	....
	Cape	93.3	4.	— .01	4.	— 1.0
	Weights	*1867.5* *1864.9*	*26.6*	*2.59*	*11.7*	*1.04*

Star	Catalogue	Epoch	R. A. p	R. A. O—C	Dec. p	Dec. O—C
				s		″
24 bis.	Br	1755.1 54.1	0.7	+ 0.03	0.1	+ 0.2
	Pi	1800.	0.8	— .04	0.5	+ 0.6
	P M	42.3	1.5	.00	1.2	— 0.6
	Cape	92.3	4.0	— .02	4.0	0.0
	Gh 90	94.0	5.0	+ .03	2.5	+ 0.2
	Flint	1905.0	4.0	— .01	2.5	0.0
Weights		*1880.8* *1884.2*	*16.0*	*2.25*	*10.8*	*0.89*
25	Bessel	1825.0	0.	— .25	0.	+ 1.1
	A G	71.0	1.	— .06	1.	— 1.2
	Rbg	77.5	4.	+ .01	4.	+ 0.3
	A G	90.1	1.	+ .06	1.	+ 0.4
	Ci	90.2	1.5	+ .07	1.	0.0
	Flint	1904.6	5.	— .01	2.5	— 0.1
Weights		*1890.3* *1886.6*	*12.5*	*0.21*	*9.5*	*0.14*
26	Br	1755.4 54.7	0.6	+ .01	0.5	+ 0.6
	P M	1824.1	2.5	+ .03	2.	0.0
	Pu M	43.2	4.	— .05	4.	+ 0.1
	Gh 80	80.5	5.	+ .04	2.5	0.0
	Gh 90	89.3	5.	.00	2.	— 0.3
	Flint	1904.7	5.	— .02	2.5	0.0
Weights		*1871.5* *1862.2*	*22.1*	*2.45*	*13.5*	*1.69*
27	Gh	1813.1 14.0	0.3	+ .04	0.5	+ 0.9
	Pa	63.8 66.1	1.5	— .02	1.	0.0
	Rbg	75.7	4.	.00	4.	— 0.4

	Star Catalogue	Epoch	R. A. p	R. A. O—C	Dec. p	Dec. O—C
				s		″
27 cont.	Gh 90	1889.4	3.	— .02	1.5	+ 0.5
	Ci 90	92.1	1.5	+ .05	1.	— 0.2
	Flint	1904.7	5.	+ .00	2.5	+ 0.4
	Weights	*1887.1* *1882.3*	*15.3*	*0.44*	*10.5*	*0.42*
28	Br	1755.	0.6	— .01	0.3	+ 0.1
	P M	1830.	2.5	+ .03	1.5	+ 0.1
	Armagh	40.	2.5	+ .02	1.5	+ 1.1
	Gh 50	50.	1.5	— .03	....	....
	Pu M	55.	4.	— .04	4.	— 1.0
	Pa 60	60.	1.	+ .05	1.	+ 1.3
	A G	75.	1.5	— .04	1.	— 0.6
	Pa 75	75.	....	....	....	....
	Becker	75.	3.	— .02	3.	+ 0.3
	Gh 80	80.	4.	+ .02	3.	+ 0.1
	Gh 90	90.	6.	.00	4.	— 0.3
	Glasgow 90	90.	2.	+ .01	1.	+ 0.9
	Weights	*1865.* *1867.*	*28.6*	*1.88*	*19.8*	*1.08*
29	Pi	1800.	0.0	— .15	0.4	— 1.1
	C Ab	30.	3.	— .02	2.	0.0
	Tay D	37.0	0.8	.00	0.5	— 1.1
	Gh 64	61.7	2.5	+ .10	2.	+ 0.6
	A G	71.7	1.	+ .04	1.	— 0.8
	Rbg	76.7	6.	.00	5.	+ 0.4
	Ci	95.9	1.5	+ .01	1.	— 0.6
	Flint	1904.2	4.0	— .06	2.5	— 0.2
	Weights	*1872.7* *1870.3*	*18.8*	*1.18*	*14.4*	*0.96*

	Star Catalogue	Epoch	R. A. p	R. A. O—C	Dec. p	Dec. O—C
				s		″
30	Br	1755.	0.5	+ .27	....	....
	P M	1830.	....	....	0.3	− 0.3
	Armagh	40.	....	....	1.2	− 0.9
	Radcliffe	45.	1.	− .26	1.	− 0.1
	Pu M	55.	4.	+ .03	4.	− 0.3
	Yarnall	60.	3.	− .02	3.5	+ 1.3
	Gh 64	64.	1.5	− .30	1.5	− 6.3
	Gh 72	72.	3.5	− .06	4.	− 0.3
	Rbg	75.	4.	+ .05	4.	+ 0.2
	Gh 80	80.	5.	+ .10	4.	0.0
	Gh 90	90.	6.	+ .02	4.5	0.0
	Weights	*1871.* *1870.*	*28.5*	*1.16*	*28.0*	*0.59*
31	Br	1755.	0.2	+ .26	....	....
	C Ab	1830.	2.5	+ .04	2.0	+ 0.4
	Armagh	40.	....	....	1.2	− 0.9
	Radcliffe	45.	1.5	− .04	1.	+ 0.5
	Pu M	55.	4.	− .09	4.	− 0.2
	Gh 64	64.	0.0	− .45	0.5	0.0
	Gh 72	72.	1.5	+ .03	1.	+ 0.6
	Rbg	75	6.	+ .05	5.	0.0
	Becker	75.	4.	+ .01	4.	0.0
	Weights	*1862.* *1862.*	*20.5*	*0.71*	*18.7*	*0.50*
32	Gr	1811.2	0.4	− .07	0.5	+ 0.3
	P M	24.0	2.5	.00	2.	0.0
	Yarnall	60.1 53.2	2.	+ .03	1.5	− 0.4
	Gh 72	68.2	3.	− .01	2.	0.0

Star	Catalogue	Epoch	R. A. p	R. A. O—C	Dec. p	Dec. O—C
				s		″
32 cont.	Rbg	1875.3	4.	+ .01	4.	— 0.1
	Gh 90	94.5	3.	— .04	1.5	+ 0.3
	Flint	1904.2	4.	+ .02	2.5	— 0.4
Weights		*1873.5* *1869.5*	*18.9*	*1.32*	*14.0*	*1.03*
33	P M	1828.7	1.	— .02	1.	— 0.8
	Pu M	49.2	5.	.00	2.	+ 0.5
	Rbg	75.2	4.	— .03	4.	— 0.1
	Wash	86.3	5.	+ .04	1.5	+ 0.3
	Ci	89.7	1.5	+ .01	1.	+ 0.9
	Flint	1904.2	4.	— .03	2.5	— 0.3
Weights		*1876.1* *1875.6*	*20.5*	*0.98*	*12.0*	*0.60*
34	Br	1755.9 54.2	0.8	+ .01	0.3	— 1.0
	C Ab	1830.	3.	— .02	2.	— 0.4
	Pu M	53.2	4.	+ .02	4.	+ 0.5
	Gh 80	86.3	1.	.00	0.5	+ 0.6
	Ci	89.7	1.5	+ .01	1.	— 0.1
	Flint	1904.2	4.	— .01	2.5	— 0.3
Weights		*1863.3* *1863.3*	*14.3*	*2.12*	*10.3*	*1.13*
35	Br	1753.9 54.2	0.8	+ .05	0.3	— 1.9
	C Ab	1830.	4.5	— .02	2.5	+ 1.4
	Pu M	41.2	4.	— .01	4.	— 0.7
	Gh 80	82.8	5.	+ .05	2.	+ 0.2
	Ci	89.6	1.5	— .03	1.	— 0.8
	Flint	1904.2	4.	— .01	2.5	0.0
Weights		*1862.1* *1860.5*	*19.8*	*2.60*	*12.3*	*1.37*

Star	Catalogue	Epoch	R. A. p	R. A. O—C	Dec. p	Dec. O—C
				s		"
36	P M	1823.7	2.5	— .01	2.0	0.0
	Rbg	76.0	3.	+ .03	3.	+ 0.1
	A G	80.8	1.	— .01	1.	0.0
	Ci	96.8	1.5	+ .01	1.	0.0
	Flint	1904.2	4.	— .02	2.5	— 0.1
	Weights	*1877.5* *1875.1*	*12.0*	*1.05*	*9.5*	*0.79*
37	Br	1754.6 54.4	0.6	.00	0.5	+ 0.4
	Gr	1810.2	0.4	— .11	0.5	+ 0.8
	P M	23.7	1.	— .03	1.	0.0
	C Ab	30.	2.5	+ .04	2.	— 0.8
	Pu M	45.5	6.	— .01	5.	+ 0.2
	Gh 90	91.2	4.	+ .01	2.	— 0.3
	Flint	1904.2	4.	— .01	2.5	+ 0.2
	Weights	*1861.1* *1854.5*	*18.5*	*2.40*	*13.5*	*1.76*
38	Br	1755.8 57.2	0.3	— 0.09	0.2	— 0.2
	Pi	1800.	0.8	— .30	0.5	+ 0.4
	P M	23.7	2.	+ .06	1.2	— 0.1
	Tay D	34.2 31.9	1.1	— .02	0.4	— 0.2
	Pu M	42.2	4.	+ .09	4.	0.0
	Ci	1900.6	3.	— .01	1.	— 0.2
	Gh	01.2	2.	— .03	1.	0.0
	Cape	02.3	5.	— .02	3.	0.0
	Weights	*1869.0* *1862.8*	*18.2*	*2.63*	*11.3*	*1.58*
39	Br	1755.	1.	— 0.03	0.4	+ 0.2
	P M	1830.	2.5	+ .02	1.5	+ 0.1
	Armagh	40.	2.	— .04	1.5	0.0

	Star Catalogue	Epoch	R. A. p	R. A. O—C	Dec. p	Dec. O—C
				s		"
39 cont.	Pa	1845.	1.	+ .01	....	....
	Pu M	55.	4.	— .01	4.	+ 0.2
	Pa	60.	1 5	— .02	0.5	+ 0.6
	Gh 64	60.	1.5	+ .06	1.	— 1.0
	Glasgow	70.	2.	+ .02	1.5	+ 0.1
	Gh 72	72.	2.	— .04	2.	+ 0.1
	Rbg	75.	4.	+ .06	4.	— 0.6
	Pa	75.	1.5	+ .06	1.	+ 0.4
	Gh 80	80.	7.	+ .01	4.	+ 0.1
	Gh 90	90.	5.5	— .05	3.5	+ 0.3
	Weights	*1865.* *1866.*	*35.5*	*2.29*	*24.9*	*1.16*
40	Br	1756.3 54.2	0.8	+ .08	0.4	— 0.8
	Pi	1800.	1.	-- .01	0.5	+ 0.9
	P M	23.5	2.	+ .01	1.5	0.0
	Tay D	35.0 35.6	1.5	+ .12	0.5	— 0.1
	Pu M	42.2	4.	— .05	4.	+ 0.4
	Pa 45	45.7 50.1	2.	— .09	1.	— 0.2
	Rbg	75.2	4.	— .01	4.	— 0.7
	Ci	98.8	2.	+ .07	1.	+ 1.4
	Weights	*1847.6* *1850.7*	*17.3*	*1.88*	*12.9*	*1.10*
41	P M	1823.5	2.	+ .03	1.5	0.0
	Rbg	77.3	8.	— .03	6.	+ 0.1
	A G	84.2	1.	+ .03	1.	— 0.1
	Ci	92.2	1.5	+ .03	1.	— 0.4
	Flint	1904.3	5.	+ .02	2.5	0.0
	Weights	*1880.5* *1878.0*	*17.5*	*0.97*	*12.0*	*0.65*

Star	Catalogue	Epoch	R. A. p	R. A. O—C	Dec. p	Dec. O—C
				s		″
42	P M	1829.2	2.5	.00	2.0	+ 0.1
	A G	69.2	1,	— .02	1.	+ 0.2
	Rbg	76.0	4.	+ .01	4.	— 0.3
	Flint	1904.3	5.	.00	2.5	+ 0.3
	Weights	*1877.4* *1872.8*	*12.5*	*0.96*	*9.5*	*0.61*
43	P M	1823.4	2.	+ .01	1.5	— 0.3
	Radcliffe	52.8 51.3	0.	— .26	0.	+ 2.1
	A G	70.8	1.	+ .10	1.	+ 0.6
	Rbg	77.8	6.	— .17	5.	0.0
	Ci	92.2	1.5	— .05	1.	+ 0.1
	Flint	1904.3	5.	— .01	2.5	— 0.2
	Weights	*1880.3* *1877.1*	*15.5*	*0.97*	*11.0*	*0.63*
44	Fed	1790.	0.	+ .28	0.	— 0.6
	P M	1823.9	1.5	+ .28	1.2	— 0.2
	Pu M	50.0 49.2	7.	— .08	2.	— 0.1
	B B vi	64.3	0.	— .05	0.	— 0.3
	Rbg	75.9	5.	— .07	5.	+ 0.3
	Gh 80	80.0	3.	+ .06	1.5	— 0.1
	Wash	85.9	8.	+ .04	2.5	— 0.1
	Ci	89.6	1.5	— .16	1.	+ 0.3
	Gh	1902.4	3.	+ .06	1.5	+ 0.2
	Flint	04.3	2.	+ .03	1.	— 0.7
	Weights	*1875.6* *1875.7*	*31.0*	*1.36*	*15.7*	*0.75*
45	Pi	1800.	1.	— 0.11	0.5	+ 0.5
	P M	28.8	2.	+ .09	1.5	— 0.9
	C Ab	30.	3.	.00	2.	+ 0.2

Star	Catalogue	Epoch	R. A. p	R. A. O–C	Dec. p	Dec. O–C
				s		″
45 cont.	Pa	1860 3	1.5	— .07	1.5	+ 0.8
	Rbg	77.4	5.	— .04	4.	0.0
	A G	80.7	1.	— .01	1.	+ 0.1
	Ci	90.7	1.5	+ .03	1.	— 0.1
	Flint	1904.3	2.	+ .04	1.	— 0.6
	Weights	*1861.8* *1863.2*	*17.0*	*1.54*	*12.5*	*0.95*
46	Br	1755.	....	....	0.3	+ 0.1
	P M	1830.	2.	+ 0.08	1.2	— 0.9
	Armagh	40.	0.5	— .11	0.5	+ 0.1
	Pa	45.	2.	— .07	1.	+ 0.4
	Pu M	55.	4.	— .08	4.	0.0
	Pa	60.	1.	+ .09	0.5	+ 2.1
	Gh 60	60.	3.	+ .03	2.5	+ 0.6
	Glasgow	70.	2.5	— .01	....	....
	Gh 72	72.	....	....	2.5	+ 0.2
	Rbg	75.	4.	— .02	4.	— 0.6
	Pa	75.	0.8	+ .10	0.5	+ 0.4
	Gh 80	80.	5.	+ .06	5.	+ 0.1
	Glasgow	90.	2.	— .05	1.5	— 0.2
	Weights	*1865.* *1865.*	*26.8*	*0.71*	*23.5*	*0.89*
47	Br	1755. 54.	0.5	+ 0.03	0.2	+ 1.4
	C Ab	1830.	4.	— .01	4.	— 0.1
	Pu M	45.	4.	.00	4.	0.0
	Gh 64	64.	2.	— .01	5.	+ 0.3
	Rbg	70.	2.	+ .02	6.	0.0
	Gh 90	....	...	....	....	....
	Ci	90.	2.	.00	2.	— 0.5
	Weights	*1850.* *1857.*	*14.5*	*1.06*	*21.2*	*.91*

	Star Catalogue	Epoch	R. A. p	R. A. O—C	Dec. p	Dec. O—C
48	Br	1756.0 55.3	0.8	— .06	0.3	+ 0.3″
	C Ab	1830.	3.	— .04	2.	+ 0.2
	Pu M	46.3	4.	+ .04	4.	— 0.4
	Wash	78.3	4.	+ .05	1.2	+ 0.8
	Ci	90.3	1.5	+ .03	1.	— 0.3
	Flint	1904.3	5.	— .05	2.5	0.0
	Weights	*1866.1* *1861.5*	*18.3*	*2.40*	*11.0*	*1.20*
49	P M	1829.3	2.	— .02	1.5	— 0.8
	Pa	67.3	0.	— .26	0.5	+ 1.3
	Rbg	76.3	4.	— .01	4.	+ 0.5
	A G	80.2	1.	+ .01	1.	+ 0.2
	Pa	80.2	1.5	+ .09	1.	+ 0.3
	Flint	1904.3	6.	— .01	3.	— 0.6
	Weights	*1882.1* *1877.8*	*14.5*	*0.87*	*11.0*	*0.58*
50	P M	1830.3	2.	.00	1.5	— 0.1
	Rbg	75.2	4.	+ .02	4.	0.0
	A G	83.3	1.	— .06	1.	+ 0.8
	Flint	1904.9	3.	— .01	1.	— 0.5
	Weights	*1876.0* *1871.2*	*10.0*	*0.67*	*7.5*	*0.39*
51	P M	1834.7	2.5	— .05	2.	+ 0.4
	Pa	65.8	1.	+ .11	1.	— 1.2
	A G	68.3	1.	+ .10	1.	— 2.1
	A G	70.2	1.	— .05	1.	+ 1.5
	Rbg	76.5	4.	+ .01	5.	+ 0.1
	Flint	1904.9	4.	— .02	2.	+ 0.2
	Weights	*1875.3* *1872.6*	*13.5*	*0.84*	*12.0*	*0.53*

	Star Catalogue	Epoch	R. A.		Dec.	
			p	O—C	p	O—C
				s		″
52	C Ab	1830.	4.	+ .01	2.	− 0.8
	Pu M	42.3	4.	.00	4.	+ 0.7
	Pa	42.9 47.3	3.	− .02	1.	− 0.7
	Gh 80	83 3	4.	+ .03	2.	− 0.6
	Ci	90.7	1.5	− .04	1.	+ 0.9
	Flint	1904.9	4.	.00	2.5	0.0
	Weights	*1863.8* *1863.7*	*20.5*	*1.70*	*12.5*	*0.96*
53	P M	1830	1.5	− 0.07	1.	+ 0.1
	Armagh	40.	2.5	+ .06	0.3	+ 3.4
	Pa	45.	1.	− .06	1.	− 1.6
	Pa	60.	1.5	+ .06	1.5	+ 0.2
	Glasgow	70.	2.	.00	1.5	0.0
	Gh 72	72.	....	....	....	....
	Pa	75.	1.5	+ .01	1.	0.0
	Gh 90	90.	5.	− .01	2.5	0.0
	Radcliffe	90.	1.	− .03	1.	+ 0.6
	Weights	*1366.* *1867.*	*16.0*	*0.77*	*9.8*	*0.41*
54	Br	1755.	1.	+ 0.05	0.5	− 1.1
	C Ab	1830.	4.	− .04	4.	0.0
	Pu M	44.	4.	+ .03	4.	+ 0.5
	Gh 64	64.	3.	− .05	3.	− 0.2
	Rbg	75.	2.	− .02	2.	− 0.5
	Ci	90.	2.	.00	2.	− 0.2
	Gh 90	94.	11.	+ .02	12.	0.0
	Weights	*1867.* *1870.*	*27.*	*27.5*	*29.2*	*2.29*

	Star Catalogue	Epoch	R. A. p	R. A. O—C	Dec. p	Dec. O—C
				s		″
	Pi	1800.	0.7	+ .05	0.4	+ 0.1
	P M	23.7	2.5	+ .01	2.	— 0.1
	Tay D	39.0	1.0	— .10	0.5	+ 1.8
	Pa	42.0	1.5	+ .01	....	....
55	Rbg	75.6	4.	— .04	4.	+ 0.2
	A G C	76.9	3.	+ .04	3.	— 0.4
	Wash	84.4	7.	+ .01	2.	+ 0.5
	Ci	90.4	1.5	— .01	1.	— 0.7
	Flint	1904.9	4.	+ .01	2.5	— 0.4
	Weights	*1878.5* *1880.1*	*22.7*	*1.12*	*13.4*	*0.76*
	Br	1755.	1.1	— 0.07	0.3	— 1.3
	P M	30.	2.	+ .08	1.5	+ 0.7
	Armagh	40.	2.	+ .03	1.5	+ 0.4
	Pa	45.	3.5	— .04	1.	— 0.6
	Radcliffe	45.	2.	+ .22	1.	+ 1.9
	Pu M	55.	4.	— .02	4.	+ 0.5
56	Pa	60.	2.5	— .07	2.	+ 0.3
	Gh 60	60.	2.	— .08	1.5	+ 0.6
	Radcliffe	60.	1.5	— .07	0.3	+ 1.7
	Rbg	75.	6.	— .03	5.	0.0
	Pa	75.	2.5	+ .05	2.	0.0
	A G C	75.	2.5	+ .05	2.	— 1.6
	Gh 90	90.	3.	+ .01	1.5	0.0
	Weights	*1858.* *1860.*	*34.6*	*2.11*	*23.6*	*0.93*
	Br	1755.	0.9	— 0.07	0.4	— 0.2
57	P M	1830.	2.	— .01	1.2	+ 0.3
	Pond	30.	3.	+ .10	1.	— 0.2

Star	Catalogue	Epoch	R. A. p	R. A. O—C	Dec. p	Dec. O—C
				s		″
57 cont.	Armagh	1840.	1.5	— .11	0.3	+ 0.5
	Pa	45.	1.	— .09	1.	— 0.7
	Pu M	55.	4.	+ .06	4.	+ 0.1
	Pa	60.	2.	— .01	2.	0.0
	Radcliffe	60.	0.5	+ .02	1.2	+ 1.0
	Gh 64	64.	2.	— .03	1 5	+ 0.3
	Rbg	75.	4.	— .03	4.	— 0.2
	Gh 80	80.	3.	— .07	1.5	— 0.5
	Gh 90	90.	3.	+ .05	1.5	+ 0.2
	Weights	*1856.5* *1859.*	*26.9*	*1.97*	*19.6*	*0.99*
58	Br	1755.	0.3	+ 0.10	0.3	+ 1.1
	P M	1830.	3.	— .03	2.	— 1.2
	C Ab	30.	4.5	— .03	2.5	+ 0.4
	Armagh	40.	2.	+ .06	1.5	0.0
	Pa	45.	2.5	+ .02	1.	+ 0.7
	Pu M	55.	4.	.00	4.	+ 0.1
	Pa	60.	1.	— .07	1.5	+ 0.2
	Yarnall	60.	1.5	+ .01	2.	— 0.4
	Radcliffe	60.	2.	+ .03	1.5	— 0.6
	Rbg	75.	6.5	+ .01	5.5	— 0.2
	A G	75.	2.	— .01	1.5	+ 0.1
	Becker	75.	4.	+ .04	4.	— 0.1
	Gh 80	80.	5.5	+ .03	3.5	+ 0.2
	Gh 90	90.	7.	— .04	4.	0.0
	Weights	*1863.* *1863.*	*45.8*	*2.23*	*34.8*	*1.53*

Star	Catalogue	Epoch	R. A. p	R. A. O—C	Dec. p	Dec. O—C
				s		″
59	Pi	1800.	0.5	+ .15	0.5	+ 2.4
	C Ab	30.	3.	— .02	2.	— 0.3
	Pu M	42.4	4.	— .01	4.	— 0.2
	Gh 64	66.4	2.	— .01	1.5	— 0.3
	A G	70.4	1.	— .02	1.	+ 0.4
	Ci	90.0	1.5	+ .01	1.	+ 0.4
	Flint	1904.5	5.	+ .02	2.5	+ 0.4
	Weights	*1866.0* *1860.1*	*17.0*	*1.66*	*12.5*	*1.08*
60	P M	1824.1	2.5	— .02	2.	+ 0.6
	A G	70.9	1.	.00	1.	+ 0.1
	Rbg	74.9	4.	+ .04	4.	— 0.7
	Flint	1904.5	2.5	— .05	2.5	+ 0.7
	Weights	*1869.2* *1871.6*	*10.0*	*0.83*	*9.5*	*0.72*
	Pa	1858.8	1.5	— .01	2.	+ 0.1
	Gh 64	66.5	1.5	— .06	1.	+ 0.3
	P a	70.4	1.	+ .03	1.	— 1.0
	A G	76.1	1.	+ .06	1.	+ 0.5
	Flint	1904.5	3.	.00	1.	0.0
	Weights	*1881.0* *1872.5*	*8.0*	*0.27*	*6.0*	*0.15*
62	C Ab	1830.	4.5	+ .01	2.5	+ 0.4
	Pu M	46.9	4.	— .04	4.	— 0.7
	Gh 64	62.7	4.	+ .01	4.	+ 0.5
	Gh 72	72.0	3.	— .03	3.	— 0.1
	Pa	72.1 72.4	1.5	+ .01	1.	0.0

	Star Catalogue	Epoch	R. A. p	R. A. O—C	Dec. p	Dec. O—C
				s		″
62 cont.	Wash	1874.0	3.	+ .05	1.	+ 0.9
	Ci	90.2	1.5	+ .06	1.	+ 0.1
	Flint	1904.5	2.	— .02	1.	— 0.1
	Weights	*1862.3* *1861.1*	*23.5*	*1.11*	*17.5*	*0.65*
63	Br	1757. 54.	0.5	+ 0.11	0.2	— 1.1
	C Ab	1830.	3.	+ .01	3.	0.0
	Pu M	45.	4.	— .07	4.	+ 0.5
	Gh 64	67.	3.	+ .05	3.	+ 0.5
	Rbg	75.	6.	+ .02	6.	+ 0.3
	Ci	90.	2.	— .02	2.	— 0.7
	Weights	*1858.4* *1859.8*	*18.5*	*1.21*	*18.2*	*0.96*
64	Bessel	1825.0	0.5	— .07	0.5	— 1.5
	Pa	60.4	0.5	+ .23	0.5	+ 0.9
	Pa	71.5	0.8	+ .19	0.5	+ 1.3
	Rbg	74.9	4.	— .05	4.	+ 0.1
	A G	80.4	1.	— .02	1.	— 0.1
	Flint	1904.5	4.	+ .00	2.	— 0.2
	Weights	*1883.1* *1878.5*	*10.8*	*0.41*	*8.5*	*0.28*
65	Br	1755.	0.2	+ 0.12	....	....
	C Ab	1830.	3.	— .06	3.	+ 0.1
	Pu M	45.	4.	+ .04	4.	— 0.3
	Gh 64	56.	2.5	— .04	2.5	+ 0.8
	Rbg	83.	1.	— .06	1.	— 0.0
	Gh 90	90.	3.	+ .02	2.	— 0.2
	Ci	92.	1.5	+ .04	1.5	— 0.1
	Weights	*1855.7* *1857.4*	*14.2*	*0.98*	*14.0*	*0.75*

	Star Catalogue	Epoch	R. A. p	R. A. O—C	Dec. p	Dec. O—C
				s		″
	Br	1755.	0.8	− 0.04	0.3	− 1.3
	P M	1830.	1.5	+ .01	1.	− 0.9
	Pond	30.	3.	− .07	1.	− 0.4
	Armagh	40.	2.	− .03	0.3	− 0.5
	Pa	45.	2.	− .13	1.	+ 0.7
	Pu M	55.	4.	+ .02	4.	+ 0.8
66	Pa	60.	7.	+ .01	0.5	− 0.4
	Gh 60	60.	2.	.00	1.5	+ 0.3
	Rbg	75.	4.	− .05	4.	− 0.4
	Pa	75.	3.	− .01	1.	0.0
	Wash	75.	4.	+ .03	1.2	+ 0.8
	Gh 80	80.	5.5	.00	3.5	− 0.2
	Gh 90	90.	5.	+ .01	2.5	− 0.3
	Weights	*1862.* *1864.*	*43.8*	*2.32*	*21.8*	*1.00*
	Br	1755.	0.3	− 0.14	0.2	+ 0.1
	P M	1830.	1.5	+ .08	1.	− 0.9
	Armagh	40.	2.5	+ .16	1.5	+ 1.2
	Pa	45.	2.	+ .03	1.	+ 0.2
	Pu M	55.	4.	− .05	4.	− 0.1
67	Pa	60.	2.	+ .05	1.	+ 0.2
	Yarnall	60.	2.	− .01	1.	+ 0.6
	Gh 64	64.	2.	− .04	1.5	− 0.9
	Glasgow	70.	2.5	− .17	1.5	− 1.2
	Armagh	75.	2.	+ .03	1.	+ 2.0
	A G	75.	2.	+ .01	1.5	0.0
	Gh 90	90.	4.	+ .05	2.5	− 0.1
	Weights	*1861.* *1860.*	*26.8*	*1.10*	*17.7*	*0.68*

Star	Catalogue	Epoch	R. A. p	R. A. O—C	Dec. p	Dec. O—C
				s		″
	P M	1828.8	2.	+ .06	1.5	− 0.1
	P M	43.4	2.	− .04	1.5	− 1.3
68	Rbg	74.9	4.	− .02	4.	+ 0.5
	Pa	74.7 75.8	2.	− .03	2.	+ 0.2
	Flint	1904.5	4.	+ .03	2.	− 0.2
	Weights	*1872.3* *1869.9*	*14.0*	*0.96*	*11.0*	*0.61*
	Br	1755.6 54.6	0.2	+ .41	0.1	+ 1.5
	Pi	1800.	1.2	− .20	0.5	+ 0.4
	P M	32.8	1.5	+ .16	1.	− 0.3
	Tay D	39.4 38.7	0.	− .67	0.4	− 0.5
69	Pa	48.1 45.5	1.	+ .04	1.	− 0.4
	Pu M	60.9	4.	− .04	4.	+ 0.2
	Rbg	78.6	5.	+ .01	5.	− 0.2
	Ci	1900.2	3.	.00	1.	+ 0.7
	Weights	*1864.5* *1863.6*	*15.9*	*1.40*	*13.0*	*0.72*
	Br	1754.4 55.1	2.	+ 0.06	0.4	+ 0.4
	Pi	1800.	1.5	− .01	0.5	− 0.8
	P M	23.6	2.	− .03	1.5	0.0
	C Ab	29.	4.	− .04	2.5	+ 0.1
	Pond	30.	3.	− .01	1.	+ 0.4
	Tay D	33.5 31.5	1.	+ .02	0.4	+ 1.1
70	Ed H	42.0 42.5	1.5	− .01	1.	+ 0.6
	Gh 45	44.	1.5	− .07	1.	− 0.9
	Pu M	44.	3.	− .01	3.	− 0.4
	Pa	45.7 46.3	5.	+ .01	3.	+ 0.2
	Radcliffe	58.4 58.9	2.	+ .18	2.	− 0.6

	Star Catalogue	Epoch	R. A. p	R. A. O—C	Dec. p	Dec. O—C
				s		″
70 cont.	Gh 60	1858.6 59.5	3.	— .03	2.	+ 0.6
	Pa	60.8 61.0	10.	— .03	4.	+ 0.5
	Ya	64.8 69.6	4.	+ .02	2.5	— 0.0
	Brux	69.2 68.2	3.	+ .02	2.	— 0.6
	Gh 72	71.6	1.5	+ .01	1.	— 1.4
	Glasgow	75.1 75.9	3.	— .12	1.	+ 1.2
	Rbg	75.4	8.	+ .01	5.	+ 0.6
	Pa	75.7 75.6	10.	.00	5.	+ 0.7
	Gr 80	78.6	5.	+ .07	2.5	— 0.4
	Glasgow 70	80.6 81.0	1.5	— .07	2.	+ 0.3
	A G	81.1	2.	+ .09	2.	+ 0.4
	Ci	90.0	2.	+ .05	1.5	+ 0.5
	Glasgow	91.4	1.5	— .09	1.	— 0.3
	Gh 90	93.3 93.9	8.	— .02	5.	— 0.6
	Radcliffe	99.5	1.5	— .04	1.	— 0.2
	Gh	99.8 00.1	5.	— .02	3.	— 0.1
	Ci	1901.3	2.	— .01	1.5	— 0.8
	Gh	04.0 04.6	4.	+ .03	2.	— 0.2
	Flint	07.6	4.	+ .06	3.	+ 0.8
	Weights	*1867.96* *1870.87*	*105.5*	*8.46*	*63.3*	*3.96*
71	Lalande	1800.	0.2	— 0.15	0.2	— 0.8
	B B vi	62.1	0.5	— .08	0.5	+ 1.3
	A G	78.4	1.	+ .16	1.	+ 0.5
	Gh	1902.0	2.	+ .07	1.	+ 0.2
	Flint	05.4	4.	— .06	2.	— 0.2
	Weights	*1895.5* *1889.8*	*7.7*	*0.31*	*4.7*	*0.27*

Star	Catalogue	Epoch	R. A. p	R. A. O—C	Dec. p	Dec. O—C
				s		″
72	P M	1825.7	1.3	+ .01	1.	+ 0.1
	A G	80.6	2.	— .01	1.5	— 0.2
	Glasgow	92.3	1.5	— .01	1.	0.0
	Radcliffe	96.9	1.5	+ .01	1.	+ 0.3
	Weights	*1875.7* *1874.7*	*6.3*	*0.43*	*4.5*	*0.32*
73	P M	1836.8	2.	+ .02	1.5	— 0.1
	Schellerup	62.6	0.	— .01	0.	+ 0.1
	Armagh	70.0	0.	— .11	1.	+ 1.5
	A G	77.6	2.5	+ .04	2.	+ 0.2
	Radcliffe	84.7	1.	— .01	1.	— 1.1
	Flint	1904.5	4.	— .03	2.	— 0.2
	Weights	*1881.2* *1876.5*	*9.5*	*0.63*	*7.5*	*0.41*
74	P M	1828.2	1.5	+ .10	1.2	+ 1.7
	P M	41.7	1.5	— .06	1.	— 1.8
	Rbg	75.1	6.	+ .04	5.	— 0.7
	Wash	85.6	5.	— .01	1.5	+ 1.0
	Ci	89.6	1.5	— .04	1.	— 1.0
	Flint	1904.5	3.	— .01	1.	+ 1.1
	Weights	*1877.4* *1872.3*	*18.5*	*0.84*	*10.7*	*0.48*
75	P M	1831.5	1.	+ .01	1.	— 0.3
	A G	70.7	1.	— .02	1.	— 0.1
	Rbg	75.0	4.	+ .04	4.	+ 0.5
	Flint	1904.5	3.	.00	1.	+ 0.2
	Weights	*1879.7* *1872.4*	*9.0*	*.43*	*7.0*	*0.26*

Star Catalogue		Epoch	R. A. p	R. A. O—C	Dec. p	Dec. O—C
				s		″
	Br	1755.	0.9	— 0.08	0.4	+ 1.2
	Armagh	1840.	2.	+ .06	0.3	+ 0.8
	Radcliffe	45.	1.	+ .01	1.	— 2.6
	Pu M	55.	4.	+ .03	4.	+ 0.2
76	Radcliffe	60.	1.	— .06	0.5	+ 0.2
	Gh 64	64.	3.5	+ .02	2.5	+ 0.1
	Rbg	75.	4.	.00	4.	— 0.2
	A G	75.	1.5	+ .05	1.	0.0
	Wash	75.	5.	— .06	1.5	+ 1.0
Weights		*1859.* *1861.*	*22.9*	*1.36*	*15.2*	*0.63*
	Br	1755.	0.8	— 0.07	0.3	— 0.5
	P M	1830.	2.	+ .01	1.5	— 0.6
	Armagh	45. 48.	2.5	+ .04	1.5	— 1.7
	Pu M	47.	4.	+ .03	4.	+ 1.3
77	Gh 64	66.	2.5	+ .03	2.	+ 0.8
	Glasgow	66. 78.	1.5	+ .04	2.5	— 0.8
	Rbg	75.	4.	— .05	4.	+ 0.7
	Glasgow	91.	1.5	— .03	1.	— 0.1
	Ci	97.	1.5	+ .06	1.5	— 0.2
Weights		*1858.* *1862.*	*20.3*	*1.63*	*18.3*	*1.00*
	P M	1830.	2.	— 0.02	1.2	— 0.3
	Armagh	40.	2.	+ .02	1.2	+ 1.0
78	Radclifie	45.	1.5	+ .04	1.	+ 0.4
	Gh 64	64.	2.	— .06	1.5	+ 0.3
	Gh 72	72.	3.5	+ .06	4.	0.0

	Star Catalogue	Epoch	R. A. p	R. A. O—C	Dec. p	Dec. O—C
				s		″
78 cont.	Rbg	75.	4.	— .11	4.	+ 0.4
	Gh 80	80.	4.	+ .08	5.	+ 0.2
	Gh 90	90.	7.5	.00	5.	— 0.9
	Weights	*1871.* *1873.*	*26.5*	*0.95*	*22.9*	*0.60*
79	Br	1754.6 53.8	0.8	+ .16	0.1	— 4.0
	Pi	1800.	1.1	— .08	0.5	+ 0.1
	Tay D	37.5	0.6	— .07	0.1	— 0.9
	P M	39.3	1.	— .03	1.2	— 0.8
	Pu M	60.6	4.	— .05	4.	+ 0.4
	Rbg	75.2	4.	+ .04	4.	+ 0.4
	Ci	98.8	5.	+ .02	2.	— 1.1
	Weights	*1864.4* *1866.9*	*16.5*	*1.99*	*11.9*	*0.67*
80	Pi	1800.	1.3	+ .06	0.5	— 0.3
	P M	30.2	2.	— .06	1.2	— 0.3
	Tay D	36.6 35.6	0.3	— .02	0.3	+ 1.3
	A G	81.0	2.	+ .04	1.	+ 1.1
	Radcliffe	98.0	1.	— .02	0.5	— 0.6
	Ci	1900.5	3.	.00	1.	— 0.6
	Weights	*1866.0* *1861.6*	*9.6*	*1.35*	*4.5*	*0.54*
81	Br	1754. 51.	1.0	— 0.05	0.6	— 0.3
	C Ab	1830.	6.5	+ .04	6.5	+ 0.1
	Pu M	60.	5.	— .03	5.	+ 0.2
	Gh 64	66. 64.	4.	— .01	9.	— 0.1

Star	Catalogue	Epoch	R. A. p	R. A. O—C	Dec. p	Dec. O—C
				s		"
81 cont.	Rbg	1871.	6.	+ .03	9.	— 0.4
	Gh 90	90.	2.	— .15	2.	+ 0.1
	Ci	95. 93.	5.	+ .04	6.	+ 0.3
	Weights	*1860.5* *1863.5*	*29.5*	*2.59*	*38.1*	*2.22*
82	Br	1754.6 54.0	0.8	+ .14	0.3	— 1.0
	P M	1823.8	2.	— .02	1.5	— 0.5
	C Ab	30.	3.	— .07	2.	+ 0.4
	Pu M	46.3	4.	+ .01	4.	— 0.2
	Pa	63.2 61.6	1.5	— .09	3.	+ 0.8
	Gh 80	84.3 82.0	3.	— .01	1.5	— 0.2
	Gh 90	94.8	5.	+ .05	2.	— 0.2
	Ci	1901.6	1.5	— .02	1.	— 0.4
	Flint	04.6	5.	— .01	2.5	— 0.2
	Weights	*1869.2* *1863.4*	*25.8*	*3.32*	*17.8*	*1.74*
83	P M	1830.1	2.	— .07	1.5	— 0.7
	Rbg	75.6	4.	+ .03	4.	+ 0.7
	A G	76.3	1.	+ .20	1.	+ 0.7
	Flint	1904.6	5.	— .04	2.5	— 0.8
	Weights	*1880.1* *1876.1*	*12.0*	*0.80*	*9.0*	*0.52*
84	Br	1753.7 54.3	1.1	+ .04	0.4	— 2.3
	C Ab	1830.	4.5	+ .01	2.5	+ 0.1
	Pu M	48.0	6.	— .01	6.	+ 0.5
	A G	70.7	1.	— .03	1.	— 0.1
	Gh 80	84.7	3.	+ .02	1.5	— 0.3
	Flint	1904.6	5.	— .02	2.5	— 0.5
	Weights	*1859.2* *1857.9*	*20.6*	*2.47*	*13.9*	*1.45*

	Star Catalogue	Epoch	R. A.		Dec.	
			p	O—C	p	O—C
				s		"
	Pi	1800.	1.	+ .02	0.5	-- 1.0
	Gr	10.7	0.3	— .34	0.5	— 0.1
	P M	23.5	2.5	— .03	2.	0.0
	Tay D	37.7	0.3	— .09	0.1	+ 0.9
85	Yarnall	59.2 67.8	2.5	+ .12	1.	+ 1.3
	A G	82.4	1.	.00	1.	— 0.6
	Gh	85.7	3.	— .04	2.	— 0.6
	Ci	1900.7	1.5	+ .05	1.	+ 0.7
	Flint	04.7	4.	— .03	2.	+ 0.1
	Weights	*1870.2* *1868.0*	*16.1*	*1.90*	*10.1*	*1.26*
	Br	1754.7 53.4	0.8	— .06	0.6	+ 0.1
	Gr	1807.7	0.4	+ .06	0.8	+ 0.5
	P M	23.7	2.5	+ .01	2.	0.0
86	Pu M	48.1	6.	+ .01	6.	— 0.1
	Rbg	75.2	4.	.00	4.	+ 0.2
	Gh 90	85.7	5.	— .01	2.5	— 0.4
	Ci	1900.6	1.5	+ .09	1.	— 0.9
	Flint	04.6	5.	— .03	2.5	+ 0.6
	Weights	*1868.2* *1861.6*	*25.2*	*2.90*	*1.94*	*2.12*
	P M	1824.8	3.	+ .00	2.	+ 0.1
	Rbg	75.2	4.	— .00	4.	+ 0.1
87	Ci	90.3	1.5	— .06	1.	+ 0.2
	A G	92.3	2.	+ .07	2.	— 0.3
	Flint	1904.6	5.	.00	2.5	0.0
	Weights	*1878.6* *1877.2*	*15.5*	*1.27*	*11.5*	*0.79*

Star	Catalogue	Epoch	R. A. p	R. A. O—C	Dec. p	Dec. O—C
				s		″
	Br	1754. 53.	0.7	— 0.05	1.8	+ 0.1
	C Ab	1830.	2.5	+ .01	3.	— 1.1
	Pu M	45.	4.	.00	4.	+ 0.2
88	Gh 64	65.	2.	— .01	1.5	— 0.5
	Rbg	76.	8.	— .06	8.	+ 0.3
	Gh 90	89.	3.	+ .01	3.	— 0.7
	Ci	94.	2.	+ .08	1.5	+ 0.5
	Weights	*1863.8* *1856.9*	*22.2*	*1.77*	*22.8*	*3.03*
	P M	1830.1	2.	— .05	1.5	— 0.1
	A G	71.6	1.	— .04	1.	+ 0.6
89	Rbg	75.1	4.	+ .08	4.	— 0.1
	Pa	81.7	0.8	— .01	0.5	+ 1.5
	Flint	1904.6	5.	— .03	2.5	— 0.3
	Weights	*1879.7* *1875.8*	*12.8*	*0.83*	*9.5*	*0.53*
	Br	1753. 54.	0.9	+ 0.01	0.8	— 0.6
	C Ab	1830.	3.	.00	2.5	— 0.4
	Pu M	41.	4.	— .01	4.	+ 0.3
90	Gh 64	60.	4.5	— .01	5.	+ 0.2
	Rbg	75.	4.	.00	4.	+ 0.1
	Gh 90	90.	1.5	— .01	2.	— 0.2
	Ci	92.	6.	+ .01	11.	— 0.1
	Weights	*1861.5* *1868.1*	*23.9*	*2.28*	*29.3*	*2.69*
	Br	1753.5 54.3	0.5	+ .20	0.2	— 0.1
91	P M	1823.5	2.5	— .02	2.	— 0.2
	C Ab	30.	3.	— .03	2.	0.0

	Star Catalogue	Epoch	R. A. p	R. A. O—C	Dec. p	Dec. O—C
				s		″
91 cont.	Rbg	1876.8	3.	— .01	3.	+ 0.1
	Gh 90	79.6	5.	— .04	2.5	+ 0.4
	Ci	1900.8	1.5	+ .08	1.	— 0.4
	Flint	03.8	4.	+ .03	2.	— 0.2
	Weights	*1867.7* *1865.7*	*19.5*	*2.34*	*12.7*	*1.33*
92	P M	1830.	2.	— 0.01	1.2	+ 0.4
	Pu M	55.	4.	— .01	4.	— 0.1
	Glasgow	70.	2.	+ .04	1.5	— 1.9
	Armagh	75.	1.	— .01	1.	+ 1.1
	A G C	75.	2.	+ .04	1.5	+ 0.7
	Radcliffe	90.	1.	— .08	1.	+ 0.4
	Weights	*1861.* *1862.*	*12.0*	*0.34*	*10.2*	*0.28*
93	Br	1754. 51.	0.2	— 1.07	0.2	— 1.0
	Armagh	1842.	....	....	1.5	+ 0.3
	Pu M	47.	4.	+ .16	4.	0.0
	Radcliffe	48. 44.	1.5	.00	1.	+ 0.2
	Radcliffe	57. 59.	1.	+ .01	1.2	— 0.2
	Gh 70	67.	2.	+ .04	1.5	+ 0.2
	Rbg	76.	7.	— .02	6.	— 0.1
	Gh 00	96. 95.	7.	— .04	2.5	— 0.1
	Weights	*1872.* *1865.*	*22.7*	*1.10*	*17.9*	*0.73*
94	Pi	1800.	1.	+ .11	0.5	+ 1.6
	P M	27.6	2.	+ .01	1.5	— 1.2
	Tay D	35.0	0.5	— .14	0.4	— 0.7
	Yarnall	73.7 73.8	3.	— .04	2.5	+ 1.3

Star	Catalogue	Epoch	R. A. p	R. A. O.—C.	Dec. p	Dec. O.—C.
				s		″
94 cont.	Rbg	1875.2	4.	— .04	4.	— 0.3
	Ci	1900.8	1.5	+ .08	1.	— 0.6
	Flint	03.8	5.	+ .02	2.5	— 0.1
Weights		*1874.4* *1872.7*	*17.0*	*1.61*	*12.4*	*0.93*
95	Br	1753.9 54.3	0.5	+ .04	0.4	+ 0.8
	P M	1828.3	2.5	+ .04	2.	— 0.3
	C Ab	30.	3.	+ .05	2.	0.0
	Pu M	45.5	6.	— .08	6.	— 0.1
	Wash	74.2	3.	+ .01	1.	+ 0.4
	Rbg	76.6	6.	.00	5.	0.0
	Gh 80	81.8	5.	+ .05	3.	+ 0.4
	Ci	91.3	1.5	.00	1.	+ 0.5
	Ci	1900.1	1.5	+ .02	1.	— 0.3
	Flint	03.8	5.	.00	2.5	— 0.4
Weights		*1867.6* *1863.4*	*34.0*	*2.94*	*23.9*	*2.02*
96	Gr	1810.8	0.3	— .04	0.5	0.0
	Radcliffe	49.4	1.	.00	1.	+ 0.5
	A G	81.8	1.	— .02	1.	— 1.1
	Gh 90	92.5	3.	+ .01	1.5	+ 0.1
	Flint	1903.8	5.	.00	2.5	+ 0.2
Weights		*1890.4* *1882.3*	*10.3*	*0.46*	*6.5*	*0.49*
97	Br	1754.8	0.8	— .03	0.2	— 1.2
	Pi	1800.	1.	— .16	0.6	— 0.6
	P M	27.5	3.5	+ .05	2.	+ 0.8
	C Ab	30.	3.	.00	2.	— 0.9

Star	Catalogue	Epoch	R. A. p	R. A. O—C	Dec. p	Dec. O—C
				s		″
97 cont.	Rbg	1875.1	4.	+ .02	4.	+ 0.7
	A G C	78.7	3.	.00	4.	— 0.3
	Wash	82.8	8.	+ .02	2.5	+ 0.8
	Ci	90.5	1.5	+ .03	1.	— 0.9
	Flint	1903.8	5.	— .06	2.5	— 0.6
	Weights	*1867.2* *1867.9*	*29.8*	*2.42*	*18.8*	*1.64*
98	C Ab	1830.	3.	.00	3.	— 0.2
	Pa	58.1	1.5	— .01	1.5	+ 0.9
	Glasgow	65.7	1.	— .01	1.	— 0.5
	A G	71.8	1.	— .06	1.	— 0.5
	Rbg	75.8	6.	+ .02	5.	+ 0.1
	Ci	90.8	1.5	— .02	1.5	— 0.2
	Weights	*1864.7* *1863.9*	*14.0*	*0.55*	*13.0*	*0.55*
99	Br	1755.	0.3	+ 0.12	0.3	0.0
	P M	1830.	2.	— .06	1.5	— 0.4
	Armagh	40.	....	....	1.5	+ 0.1
	Radcliffe	45.	2.	— .04	1.	+ 0.8
	Pu M	55.	4.	+ .03	4.	0.0
	Yarnall	60.	2.	+ .01	1.5	+ 0.4
	Gh 64	64.	2.5	.00	1.5	— 0.8
	Wash	75.	3.	— .01	1.	0.0
	Gh 90	90.	3.	— .01	1.5	+ 0.3
	Glasgow	90.	2.	+ .04	1.5	— 0.2
	Weights	*1863.* *1858.*	*20.8*	*1.08*	*15.3*	*0.89*

Star	Catalogue	Epoch	R. A. p	R. A. O−C	Dec. p	Dec. O−C
				s		″
	C Ab	1830.	3.5	.00	2.	− 0.1
	Glasgow	63.1	5.	+ .02	3.	0.0
100	A G	87.1	1.	− .01	1.	+ 0.2
	Ci	90.8	1.5	− .10	1.	− 0.5
	Flint	1903.8	5.	+ .02	2.5	+ 0.2
	Weights	*1872.6* *1872.3*	*16.0*	*1.23*	*9.5*	*0.69*
	Br	1755.9 54.6	0.8	+ .04	0.4	− 0.3
	Pi	1800.	0.9	+ .20	0.5	+ 0.8
	P M	24.8	2.5	− .02	2.	− 0.5
101	Tay D	32.7	0.6	+ .03	0.4	+ 0.1
	Pu M	46.3	4.	− .10	4.	+ 0.2
	Ci	99 8	3.	+ .07	1.	− 0.3
	Weights	*1845.0* *1839.8*	*11.8*	*1.83*	*8.3*	*0.78*
	Br	1754.5 54.1	0.8	− .11	0.4	− 1.0
	C Ab	1830.	3.5	.00	2.	+ 0.8
	Pu M	45.5	4.	+ .04	4.	− 0.5
	Glasgow	62.0	2.5	− .04	2.	+ 0.8
	Rbg	75.2	6.	+ .03	6.	+ 0.2
102	Wash	77.6	5.	− .01	1.5	0.0
	Gh 80	79.5 80.8	4.	+ .02	4.	− 0.6
	Gh 90	93.9 91.7	8.	− .03	5.	0.0
	Ci	96.8	1.5	+ .01	1.	+ 0.5
	Ci	1901.0	1.5	− .02	1.	+ 0.3
	Flint	03.8	5.	− .03	2.5	− 0.1
	Weights	*1874.8* *1873.3*	*41.8*	*3.13*	*29.4*	*1.84*

	Star Catalogue	Epoch	R. A. p	R. A. O—C	Dec. p	Dec. O—C
				s		″
	P M	1833.3	1.	+ .06	1.	— 0.4
	Pa	59.8	2.	— .06	1.5	— 0.2
	Brux	66.5 68.8	0.	— .13	0.	— 0.4
103	A G	70.5	1.	+ .06	1.	0.0
	Rbg	76.2	5.	+ .05	5.	0.0
	Pa	79.8	1,5	.00	1.	+ 1.4
	Flint	1903.8	4.	— .01	2.	— 0.6
	Weights	*1878.6* *1875.0*	*14.5*	*0.54*	*11.5*	*0.41*
	Br	1753. 54.	0.7	— 0.13	0.7	— 0.2
	C Ab	1830.	4.	+ .06	4.	— 0.3
	Pu M	49.	5.	+ .01	5.	+ 0.5
104	Gh 64	66.	2.	— .01	2.	0.0
	Rbg	73.	3.	— .03	3.	— 0.1
	Gh 90	89.	2.	— .07	2.	— 0.1
	Ci	94.	9.	+ .01	10.	0.0
	Weights	*1866.4* *1867.6*	*25.7*	*2.38*	*27.2*	*2.44*

TABLE V

Proper Motions of Faint Stars.

No.	Bright Star	Mag.	1900		1900	
			R. A.	Dec.	A	D
			h m	°	″	″
1	Arg. 559	9.1	0 1	28.5	− 146.3	− 54.6
2	α Andromedae	10.9	3	28.5	− 73.5	+ 5.9
3	Σ 23	9.9	12	− 0.2	− 2.1	+ 5.5
4	σ 6	9.5	15	37.7	+ 21.6	+ 64.8
5	42 Piscium	10.8	17	12.9	− 13.4	+ 25.7
6	49 Piscium	10.4	26	15.5	+ 18.5	− 4.5
7	Σ 42 A B	8.6	31	29.5	+ 2.6	+ 5.0
8	Σ 42 A C	10.1	31	29.5	− 12.8	− 34.2
9	54 Piscium	10.9	34	20.7	+ 118.7	− 6.9
10	α Cassiopeiae	9.5	35	56.0	− 63.0	+ 11.3
11	μ Andromedae	9.9	51	38.0	+ 179.2	+ 206.3
12	Σ 80	8.5	54	0.2	− 13.6	+ 17.3
13	μ Cassiopeiae	10.6	1 0	54.5	− 88.8	− 160.2
14	σ^2 Piscium	9.5	1	31.6	− 51.5	+ 22.4
15	80 Piscium	10.0	3	5.1	+ 123.0	− 100.5
16	ϑ Cassiopeiae	10.0	5	54.6	+ 105.3	− 102.1
17	ψ Cassiopeiae A, B C	10.2 10.9	18	67.6	+ 24.7	− 9.0
18	Σ 125	10.2	22	− 0.7	− 10.6	+ 37.5
19	μ Piscium	11.1	25	5.6	− 153.3	+ 95.0
20	Σ 132 *seq.*	10.0	27	16.4	− 6.3	+ 38.1
21	υ Andromedae	9.0	31	40.9	− 275.6	+ 54.1
22	Σ 142	8.3	34	14.8	− 4.4	+ 14.4
23	107 Piscium	10.4	37	19.8	− 19.9	+ 86.9
24	6 h Persei	10.0	2 7	50.6	+ 125.8	+ 43.4
25	o Ceti	9.3	14	− 3.4	+ 114.7	+ 20.1

No.	Centennial Motions, 1850						Authority
	Bright *		Faint *-Bright *		Faint *		
	A′	D′	A′	D′	A′	D′	
			″	″			
1	+ 38.30	− 18.79	− 37.03	+ 16.50	+ 1.27	− 2.29	C
2	+ 11.11	− 16.26	− 13.43	+ 14.50	+ 0.68	− 1.76	N
3	+ 1.02	+ 11.00	− 3.18	− 11.64	− 2.16	− 0.64	C
4	− 14.05	− 27.16	+ 14.86	+ 27.38	+ 0.81	+ 0.22	C
5	+ 5.93	+ 3.15	− 6.73	− 6.35	− 0.80	− 3.20	C
6	− 2.49	+ 1.95	+ 8.05	− 0.32	+ 5.56	+ 1.63	C
7	+ 17.12	− 40.54	− 0.47	+ 0.74	....	....	C
8	+ 17.12	− 40.54	− 18.34	+ 40.14	− 1.22	− 0.40	C
9	− 46.04	− 37.39	+ 47.99	+ 36.94	+ 1.95	− 0.45	C
10	+ 5.30	− 3.18	− 5.58	+ 2.66	− 0.28	− 0.52	N
11	+ 15.58	+ 3.03	− 12.10	− 2.48	+ 3.48	+ 0.55	N
12	− 3.96	− 10.70	+ 2.57	+ 10.25	− 1.39	− 0.45	C
13	+ 341.83	− 154.04	− 343.67	+ 156.30	− 1.84	+ 2.26	N
14	+ 0.70	− 1.80	− 0.42	+ 1.31	+ 0.28	− 0.49	C
15	− 27.45	− 17.13	+ 24.98	+ 5.82	− 2.47	− 11.31	N
16	+ 22.73	− 1.66	− 21.54	+ 2.05	+ 1.19	+ 0.39	C
17	+ 6.97	+ 3.11	− 7.46	− 2.89	− 0.49	+ 0.22	N
18	+ 27.94	− 34.37	− 29.77	+ 34.95	− 1.83	+ 0.58	C
19	+ 29.69	− 2.66	− 26.01	+ 0.86	+ 3.68	− 1.80	N
20	+ 11.44	− 20.39	− 12.25	+ 19.64	− 0.81	− 0.75	C
21	− 17.22	− 37.71	+ 20.14	+ 38.70	+ 2.92	+ 0.99	N
22	− 3.82	− 2.04	+ 22.22	− 4.42	?	?	C
23	− 29.45	− 67.07	+ 30.30	+ 66.55	+ 0.85	− 0.52	C
24	+ 35.07	− 16.49	− 35.42	+ 16.16	− 0.35	− 0.33	N
25	+ 0.33	− 22.86	− 0.60	+ 21.91	− 0.27	− 0.95	N

No.	Bright Star	Mag.	1900 R. A.	1900 Dec.	1900 A	1900 D
			h m	°	″	″
26	ϑ Persei	9.8	37	48.8	− 49.5	− 52.8
27	η Persei	8.5	43	55.5	− 24.5	+ 14.2
28	41 Arietis A B	11.2	44	26.8	− 22.7	+ 0.3
29	41 Arietis A C	10.9	2 44	26.8	− 15.0	− 29.0
30	41 Arietis A D	9.0	44	26.8	− 97.7	− 79.0
31	16 Persei	9.3	44	37.9	+ 145.6	− 207.8
32	$\varkappa$ Ceti	8.0	3 14	3.0	+ 108.4	− 246.3
33	Σ 412, 7 Tauri	10.0	28	24.1	+ 19.0	+ 11.4
34	40, o, Persei	9.4	36	33.6	− 16.9	− 10.9
35	43 Persei	10.1	50	50.4	+ 36.9	+ 65.5
36	39 Tauri	7.9	59	21.7	+ 8.6	+ 168.5
37	A′ Tauri	9.3	59	21.8	− 21.4	− 136.1
38	$O\Sigma$ 531 A B	8.8	4 1	37.8	+ 1.6	− 1.3
39	$O\Sigma$ 531 A C	7.5	1	37.8	− 111.8	− 216 3
40	40 Eridani A D	12.0	11	− 7.9	+ 9.8	+ 181.3
41	40 Eridani A B	12.0	11	− 7.9	+ 80.1	− 21.3
42	40 Eridani A E	12.0	11	− 7.9	+ 71.0	+ 44.7
43	φ Tauri	8.1	14	27.1	− 20.6	− 48.6
44	α Tauri	10.3	30	16.3	+ 65.6	+ 97.8
45	1 Orionis	10.0	44	6.8	+ 66.6	− 70.7
46	13 Orionis A B	9.1	5 2	9.4	− 123.4	− 15.2
47	13 Orionis A C	8.2	2	9.4	− 403.	− 17.5
48	Σ 634, 19 H Camelop.	7.8	6	79.1	+ 3.5	+ 13.3
49	α Aurigae	9.0	9	45.9	+ 87.0	− 122.6
50	λ Aurigae	9.2	12	40.0	+ 16.7	+ 131.9

No.	Centennial Motions, 1850						Authority
	Bright *		Faint *-Bright *		Faint *		
	A′	D′	A′	D′	A′	D′	
			″	″			
26	+ 34.92	− 8.53	− 33.22	+ 8.33	+ 1.70	− 0.20	N
27	+ 3.49	− 1.14	− 0 36	− 0.15	....	....	N
28	+ 6.79	− 11.11	− 8.22	+ 11.06	− 1.43	− 0.05	N
29	+ 6.79	− 11.11	− 6.72	+ 9.89	+ 0.07	− 1.22	N
30	+ 6.79	− 11.11	− 4.58	+ 10.48	+ 2.21	− 0.63	N
31	+ 15.74	− 10.22	− 19.97	+ 12.39	− 4.23	+ 2.17	C
32	+ 27.08	+ 9.83	− 30.05	− 8.07	− 2.97	+ 1.76	N
33	+ 0.90	− 3.06	− 1.17	+ 1.80	?	?	C
34	+ 1.58	− 1.03	− 0.01	− 0.44	?	?	C
35	+ 9.48	− 12.81	− 0.86	+ 0.16	....	....	C
36	+ 16.11	− 13.75	− 15.00	+ 5.84	+ 1.11	− 7.91	C
37	+ 9.69	− 5.75	− 8.76	+ 3.51	+ 0.93	− 2.24	N
38	+ 18.07	− 21.53	− 0.85	+ 3.39	....	....	C
39	+ 18.07	− 21.53	− 18.59	+ 21.41	− 0.52	− 0.12	C
40	− 218.90	− 344.43	+ 219.40	+ 341.15	+ 0.50	− 3.28	N
41	− 218.90	− 344.43	+ 0.62	+ 5.99	....	....	N
42	− 218.90	− 344.43	+ 221.92	+ 341.70	+ 3.02	− 2 73	N
43	− 2.59	− 7.80	+ 7.23	+ 1 06	?	?	C
44	+ 6.90	− 18.89	+ 2.13	+ 14.95	+ 9.03	− 3.94	N
45	+ 46.48	+ 2.62	− 46.96	− 2.74	− 0.48	− 0.12	N
46	− 0.34	− 38.33	+ 1.53	+ 37.54	+ 1.19	− 0.79	C
47	− 0.34	− 38.33	* * * *	+ 39.17	* * * *	+ 0.84	C
48	− 8.19	+ 15.26	+ 15.29	− 30.54	+ 7.10	− 15.28	N
49	+ 9.36	− 42.79	− 8.63	+ 41.48	+ 0.73	− 1.31	N
50	+ 53.57	− 65.51	− 52.97	+ 64.94	+ 0.60	− 0.57	N

No.	Bright Star	Mag.	1900 R. A.	1900 Dec.	1900 A	1900 D
			h m	°	″	″
51	111 Tauri	9.0	5 19	17.3	— 79.8	— 0.7
52	ϑ′ Orionis A E	10.8	30	— 5.4	— 0.6	+ 4.0
53	ϑ′ Orionis C F	11.0	30	— 5.4	+ 3.5	— 2.0
54	South 503	8.0	50	13.9	— 4.4	+ 8.6
55	ϑ Aurigae A C	10.6	53	37.2	— 43.2	+ 18.9
56	ϑ Aurigae A D	9.4	53	37.2	— 24.0	+ 126.5
57	15 Geminorum	8.1	6 22	20.8	— 11.9	— 26.9
58	6 Lyncis	8.6	22	58.2	+ 160.8	— 82.3
59	8 Lyncis A B	7.8	29	61.6	+ 152.5	+ 26.8
60	OΣ 154	8.7	37	40.7	+ 22.0	— 14.2
61	56 Aurigae	8.6	40	43.7	+ 17.6	+ 41.1
62	15 Lyncis	9.9	49	58.6	+ 45.3	— 195.0
63	45 Geminorum	10.9	7 3	16.1	+ 2.6	+ 3.0
64	Castor A B, C	9.5	28	32.1	+ 22.3	— 68.1
65	Castor A D	9.5	28	32.1	— 140.3	— 152.3
66	Procyon A B	9.0	34	5.5	— 342.	+ 124.0
67	Procyon A C	8.5	34	5.5	+ 358.	+ 79.5
68	Procyon A D	12.2	34	5.5	— 15.8	+ 55.4
69	Pollux A B	10.5	39	28.3	+ 235.6	+ 59.6
70	Pollux B C	10.8	39	28.3	— 57.7	— 0,8
71	Pollux A D	11.2	39	28.3	+ 218.6	+ 0.3
72	Pollux A E	11.7	39	28.3	— 92.5	+ 144.3
73	π Geminorum	11.0	41	33.7	— 11.3	— 18.2
74	29 Monocerotis A B	10.8	8 4	— 2.7	+ 30.8	— 8.1
75	29 Monocerotis A C	8.6	4	— 2,7	— 60.1	— 28.1

No.	Centennial Motions, 1850						Authority
	Bright *		Bright *–Faint *		Faint *		
	A′	D′	A′	D′	A′	D′	
			″	″			
51	+ 23.48	− 0.54	− 23.14	+ 1.59	+ 0.34	+ 1.05	C
52	+ 1.61	+ 0.04	− 0.27	+ 0.03	....	....	C
53	+ 0.06	+ 1.29	+ 1.05	+ 0.40	....	....	C
54	+ 38.48	− 47.98	− 43.40	+ 48.07	− 4.92	+ 0.09	C
55	+ 5.71	− 9.02	− 5.91	+ 6.74	− 0.20	− 2.28	N
56	+ 5 71	− 9.02	− 6.48	+ 7.73	− 0.77	− 1.29	N
57	− 3.24	− 5.21	+ 3.45	+ 3.18	+ 0 21	− 2.03	C
58	+ 0.35	− 32.59	+ 1.25	+ 34.25	+ 1.60	+ 1.66	N
59	− 18.71	− 27.84	+ 18 95	+ 28.66	+ 0.24	+ 0.82	N
60	− 1.59	− 15.97	+ 1.93	+ 14.94	+ 0 34	− 1.03	C
61	+ 1.79	+ 16.03	+ 1.16	− 16.72	+ 2.95	− 0.69	N
62	+ 1.80	− 12.96	− 0.84	+ 13.00	+ 0.96	+ 0.04	N
63	− 1.02	− 10.90	− 0.82	+ 10.29	− 1.84	− 0.61	N
64	− 18.20	− 8.30	− 2.97	+ 0.68	....	....	N
65	− 18.20	− 8.30	+ 17.05	+ 7.11	− 1.15	− 1.19	N
66	....	− 102.23	* * * *	+ 101.44	* * * *	− 0.79	Au.
67	....	− 102.23	* * * *	+ 101.55	* * * *	− 0.68	Au.
68	− 70.83	− 102.23	+ 68.27	+ 101.16	− 2.56	− 1.07	Au.
69	− 62.08	− 5.90	+ 61.93	+ 5.25	− 0.15	− 0.65	N
70	− 0.15	− 0.65	+ 0.06	− 1.09	− 0.09	− 1.74	N
71	− 62.08	− 5.90	+ 61.39	+ 3.20	− 0.69	− 2.70	N
72	− 62.08	− 5.90	+ 61.24	+ 4.30	− 0.84	− 1.60	N
73	− 0.42	− 4.25	+ 0.83	+ 1.47	?	?	N
74	− 2.10	+ 1.15	+ 0.24	− 0.42	....	....	C
75	− 2.10	+ 1.15	+ 0.71	+ 1.14	....	....	C

No.	Bright Star	Mag.	1900 R. A.	1900 Dec.	1900 A	1900 D
			h m	°	″	″
76	Arg 167 A B	11.1	8 5	32.8	− 37.4	+ 36.4
77	Arg 167 A C	9.9	5	32.8	+ 213.9	+ 55.3
78	Br 1169	9.3	9	59.5	+ 13.9	+ 95.1
79	Camelop 176	9.2	10	72.7	+ 43.5	+ 3.2
80	σ 294	8.5	18	42.3	+ 14.4	− 76.4
81	δ Cancri	12.0	39	18.5	+ 38.3	− 12.1
82	Σ 1263	8.2	39	42.0	+ 18.8	+ 51.6
83	10 Ursae Majoris A B	10.0	54	42.2	− 47.9	− 124.2
84	10 Ursae Majoris A C	10.3	54	42.2	+ 207.8	− 73.2
85	75 Cancri	9.1	9 3	27.0	+ 69.3	+ 83.3
86	81 π Cancri	9.1	7	15.4	− 171.1	− 144.7
87	ϑ Hydrae	10.4	9	2.8	+ 0.6	− 46.0
88	σ 331	9.0	9	23.8	+ 58.9	+ 7.5
89	40 Lyncis A, B C	8.6 10.2	15	34.8	+ 118.9	+ 175.5
90	41 Lyncis A B	7.7	22	46.0	+ 25.5	− 76.0
91	Σ 1351, 23 h Ursae Majoris	9.3	24	63.5	− 22.7	+ 0.1
92	6 Leonis	9.0	27	10.2	+ 35.8	+ 10.1
93	7 Leonis	9.4	30	14.8	+ 40.3	+ 7.2
94	9 Sextantis	8.9	49	5.4	− 49.2	+ 17.8
95	α Leonis	8.2	10 3	12.5	− 141.7	+ 105.2
96	γ Leonis A C	9.1	14	20.4	− 152.0	+ 90.2
97	γ Leonis A D	10.1	14	20.4	− 280.4	+ 177.7
98	σ 362	8.9	18	6.2	− 13.6	+ 56.9
99	χ Leonis	9.5	11 0	7.9	− 234.6	+ 157.8
100	σ 377	8.3	5	66.6	− 43.8	− 48.1

No.	Centennial Motions, 1850						Authority
	Bright *		Bright *–Faint *		Faint *		
	A′	D′	A′	D′	A′	D′	
			″	″			
76	− 45.92	− 65.77	+ 46.46	+ 61.16	+ 0.54	− 4.61	C
77	− 45.92	− 65.77	+ 43.92	+ 71.14	− 2.00	+ 5.37	C
78	− 2.27	− 3.74	− 0.38	+ 2.22	− 2.65	− 1.52	C
79	+ 0.39	− 3.27	− 1.08	− 0.55	?	?	C
80	+ 0.36	+ 0.15	− 6.15	− 6.64	?	?	C
81	− 1.06	− 23.99	− 1.23	+ 22.29	− 2.29	− 1.70	N
82	− 29.40	− 65.00	+ 26.56	+ 65.25	− 2.84	+ 0.25	C
83	− 42.98	− 26.01	+ 39.00	+ 21.84	− 3.98	− 4.17	N
84	− 42.98	− 26.01	+ 42.88	+ 22.34	− 0.10	− 3.67	N
85	− 12 35	− 39.12	+ 12.17	+ 32.70	− 0.18	− 6.42	C
86	− 52.52	+ 23.51	+ 54 03	− 23.77	+ 1.51	− 0.26	C
87	+ 13.35	− 31.15	− 16.67	+ 33.76	− 3.32	+ 2.61	N
88	− 12.37	− 16.11	+ 13.32	+ 9.15	+ 0.95	− 6.96	C
89	− 21.89	+ 1.13	+ 21.13	− 2.90	− 0.76	− 1.77	N
90	− 0.50	− 12.96	− 0.69	+ 8.83	− 1.19	− 4.13	C
91	+ 12.26	+ 2.52	+ 0.08	− 1.39	....	....	N
92	+ 0.68	− 1.36	+ 0.33	+ 0.55	?	?	C
93	− 2.30	− 0.49	− 0 36	+ 0.15	?	?	C
94	− 4.42	+ 0.24	− 1.81	− 2.98	?	?	C
95	− 24.71	− 0.25	+ 0.27	− 0.74	....	....	N
96	+ 29.88	− 15.10	− 79.29	+ 11.14	− 49.41	− 3.96	N
97	+ 29.88	− 15.10	− 31.58	+ 12.04	− 1.70	− 3.06	N
98	− 24.56	− 7.64	+ 25.12	+ 6.26	+ 0.56	− 1.38	C
99	− 34.70	− 4.11	+ 34.00	+ 0.11	− 0.70	− 4.00	N
100	+ 0.72	+ 3.21	− 33.40	− 12.29	− 32.68	− 9.08	C

No.	Bright Star	Mag.	1900 R. A.	1900 Dec.	1900 A	1900 D
			h m	°	"	"
101	Σ 1517 A C	10.3	11 8	20.7	+ 202.6	— 45.3
102	Σ 1516 A B	7.6	9	74.0	+ 18.8	— 2.5
103	Σ 1516 A C	10.5	9	74.0	— 6.3	+ 3.5
104	δ Leonis	10.1	9	21.1	— 50.3	+ 180.6
105	81 Leonis	9.7	20	17.0	— 12.14	+ 55.0
106	61 Ursae Majoris	11.2	36	34.8	+ 156.4	— 31.8
107	62 Ursae Majoris	9.3	36	32.3	— 76.2	+ 42.7
108	β Virginis	10.6	46	2.3	— 233.1	+ 58.8
109	Σ 1607	8.6	12 6	36.6	+ 0.9	+ 29.5
110	12 Comae	8.7	18	26.4	+ 14.3	— 63.6
111	Σ 1658 A B	9.4	30	8.0	— 0.1	+ 2.5
112	Σ 1658 A C	8.3	30	8.0	— 105.8	— 19.2
113	γ Virginis A B, C	8.5	37	— 0.9	— 1.4	— 254.5
114	Σ 1678	7.2	40	14.9	— 8.5	— 31.3
115	33 Virginis	8.1	41	10.1	— 28.6	— 172.1
116	Σ 1682, Pi XII, 196	9.3	46	— 9.8	— 26.0	+ 18.0
117	δ Virginis	10.5	51	4.0	+ 101.8	— 120.2
118	42 Comae	10.5	13 5	18.0	— 63.6	+ 99.6
119	43 Comae	10.6	7	28.4	— 92.2	— 23.8
120	σ 434	8.0	10	— 10.8	+ 55.0	+ 44.6
121	61 Virginis	9.5	13	— 17.8	+ 105.4	+ 194.4
122	70 Virginis	8.4	24	14.3	— 191.2	— 218.3
123	72 Virginls	11.4	27	— 6.0	+ 8.4	+ 28.0
124	η Bootis	9.4	50	18.9	+ 108.5	— 33.9
125	ι Bootis, Σ 3124	7.5	14 13	51.8	+ 21.0	+ 32.2

No.	Centennial Motions, 1850						Authority
	Bright *		Bright *-Faint *		Faint *		
	A′	D′	A′	D′	A′	D′	
			″	″			
101	− 38.60	− 14.08	+ 36.19	+ 13.09	− 2.41	− 0.99	C
102	− 39.17	+ 10.66	+ 40.39	− 10.94	+ 1.22	− 0.28	C
103	− 39.17	+ 10.66	+ 2.24	+ 0.08	....	....	C
104	+ 15.08	− 14.05	− 15.04	+ 11.39	+ 0.04	− 2.66	N
105	− 14.05	− 1.73	+ 14.00	+ 0.13	− 0.05	− 1.60	C
106	− 0.18	− 38.42	+ 2.38	+ 38.44	+ 2.20	+ 0 02	C
107	− 35.05	+ 2.16	+ 36.26	− 11.40	+ 1.21	− 9.24	C
108	+ 74.01	− 27.43	− 74.85	+ 24.75	− 0.84	− 2.68	N
109	− 5.25	+ 1.21	+ 9.43	− 4.74	+ 4.18	− 3.53	C
110	− 0.64	− 0.72	+ 0.19	− 0.04	?	?	N
111	+ 15.81	− 9.28	+ 0.90	+ 0.67	....	....	C
112	+ 15 81	− 9.28	− 18.85	+ 10.17	− 3.04	+ 0.89	C
113	− 54.81	+ 0.45	+ 51.54	− 1.02	− 3.27	− 0.57	N
114	− 6.05	+ 0.39	+ 12.72	− 5.04	+ 6.67	− 4.65	C
115	+ 27.36	− 46.63	− 37.06	+ 42.59	− 9.70	− 4.04	C
116	− 0.56	− 2.29	+ 0.22	− 4.36	?	?	C
117	− 47.64	− 5.95	+ 42.78	+ 1.36	− 4.86	− 4.59	N
118	− 43.74	+ 12.43	+ 42.11	− 14.38	− 1.63	− 1.95	C
119	− 78.93	+ 88.05	+ 76.89	− 91.00	− 2.04	− 2.95	N
120	− 22.86	− 31.04	+ 22.09	+ 30.24	− 0.77	− 0.80	C
121	− 107.47	− 106.86	+ 107.06	+ 101.81	− 0.41	− 5.05	N
122	− 24.50	− 58.36	+ 25.92	+ 59.14	+ 1.42	+ 0.78	N
123	+ 2.63	+ 1.28	+ 0.03	− 0.89	?	?	C
124	− 6.35	− 36.31	+ 4.87	+ 36.18	− 1.48	− 0.13	N
125	− 13.54	+ 8.43	+ 0.44	+ 0.54	....	....	N

No.	Bright Star	Mag.	1900 R. A.	1900 Dec.	1900 A	1900 D
			h m	°	″	″
126	ϑ Bootis	10.7	14 23	52.3	— 2.8	— 69.0
127	ρ Bootis	12.0	28	30.6	— 21.0	+ 46.0
128	γ Bootis A B	12.8	28	38.8	+ 28.3	— 8.1
129	σ Bootis A B	11.4	30	30.2	+ 235.7	+ 30.8
130	σ Bootis B C	9.9	30	30.2	— 0.6	— 60.1
131	Sh 190 A E	12.	52	— 20.9	+ 2.0	— 64.4
132	Sh 190 A F	13.	52	— 20.9	— 97.2	+ 133.8
133	18 Librae	10.2	54	— 10.8	+ 12.5	+ 15.2
134	5 Serpentis	10.3	15 14	2.2	+ 6.8	+ 8.4
135	β Serpentis	9.1	42	15.7	— 30.7	— 2.9
136	39 Serpentis	11.6	48	13.5	+ 86.9	— 48.2
137	γ Serpentis	10.5	52	16.0	— 139.0	+ 132.1
138	Σ 1993	9.2	55	17.7	+ 18.3	+ 22.6
139	σ 502	10.2	57	26.5	+ 44.1	— 16.9
140	ρ Coronae	10.0	57	33.6	+ 80.0	+ 10.8
141	49 Serpentis A B, C	10.0	16 8	13.8	+ 197.7	— 142.7
142	σ Coronae A B, C	10.0	11	34.1	+ 62.2	+ 5.4
143	γ Herculis	9.5	18	19.4	— 34.2	— 22.2
144	23 Herculis	9.0	19	32.6	+ 10.9	+ 32.6
145	ω Herculis	11.8	20	14.3	+ 32.0	— 7.1
146	O Σ 311	10.6	23	21.1	— 2.4	— 6.3
147	42 Herculis	10.6	36	49.1	+ 23.6	— 0.9
148	41 Herculis A B	9.2	40	6.3	— 31.6	— 160.1
149	41 Herculis A C	9.5	40	6.3	— 147.6	— 65.9
150	43 Herculis	9.2	41	8.8	— 63.7	— 52.8

No.	Centennial Motions, 1850						Authority
	Bright *		Bright *–Faint *		Faint *		
	A′	D′	A′	D′	A′	D′	
			″	″			
126	− 23.59	− 40.38	− 0.90	− 0.42	....	....	N
127	− 9.37	+ 11.40	+ 11.46	− 11.06	+ 2.09	+ 0.34	N
128	− 10.64	+ 14.56	+ 10.82	− 18.30	+ 0.18	− 3.74	N
129	+ 19.52	+ 12.40	− 20.53	− 12.38	− 1.01	+ 0.02	N
130	− 1.01	+ 0.02	+ 1.14	− 5.36	+ 0.13	− 5.34	N
131	+ 103.50	− 179.72	− 102.71	+ 176.53	+ 0.79	− 3.19	N
132	+ 103.50	− 179.72	− 105.32	+ 172.69	− 1.82	− 7.03	N
133	− 10.69	− 8.64	+ 0.04	+ 0.19	....	....	C
134	+ 37.48	− 52.27	+ 0.18	+ 0.90	....	....	C
135	+ 7.82	− 5.59	− 0.29	− 0.46	....	....	N
136	− 16.61	− 58.10	+ 16.05	+ 55.94	− 0.56	− 2.15	C
137	+ 29.84	− 129.03	− 34.53	+ 129 23	− 4.69	+ 0.20	N
138	− 0.89	+ 0.81	− 3.57	− 6.39	?	?	C
139	− 9.08	+ 3.00	+ 6.83	− 6.15	− 2.25	− 3.15	C
140	− 20.84	− 77.55	+ 20.78	+ 75.14	− 0.06	− 2.41	C
141	+ 17.03	− 42.50	− 19.25	+ 43.01	− 2.22	+ 0.51	C
142	− 30.56	− 9.01	+ 29.54	+ 7.05	− 1.02	− 1,96	N
143	− 4.78	+ 3.69	+ 2.66	− 6.17	− 2.12	− 2.48	N
144	+ 2.23	− 2.77	− 1.99	− 2.50	?	?	N
145	+ 2.76	− 6.10	− 4.77	+ 5.00	− 2.01	− 1.10	Au.
146	− 2.10	− 11.10	− 2.99	+ 13.10	− 5.09	+ 2.00	C
147	− 1.80	+ 3.82	+ 1.93	− 0.22	?	?	N
148	− 22.35	− 28.23	+ 1.58	+ 0.84	....	....	C
149	− 22.35	− 28.23	+ 22.58	+ 25.96	+ 0.23	− 2.27	C
150	− 0.50	+ 3.58	− 0.93	− 1.90	?	?	C

No.	Bright Star	Mag.	1900 R. A.	1900 Dec.	1900 A	1900 D
			h m	°	"	"
151	19 Ophiuchi	9.3	16 42	2.2	+ 22.8	− 0.5
152	Σ 2120	9.4	17 0	28.2	− 6.9	− 3.4
153	60 Herculis	10.8	1	12.9	− 42.2	− 34.8
154	δ Herculis	8.5	11	25.0	− 2.7	− 14.5
155	72 Herculis	9.3	17	32.6	− 93.0	+ 184.9
156	54 Ophiuchi	11.1	30	13.2	+ 20.7	+ 6.6
157	ψ Draconis	10.3	45	72.2	+ 77.5	− 52.3
158	67 Ophiuchi	8.1	56	2.9	+ 32.8	− 43.5
159	70 Ophiuchi A B, a	12.8	18 1	2.5	+ 63.0	+ 79.8
160	70 Ophiuchi A B, b	12.5	1	2.5	− 25.2	− 44.3
161	70 Ophiuchi A B, c	11.8	1	2.5	− 118.7	− 106.0
162	η Serpentis	9.8	16	− 2.9	+ 144.5	+ 68.9
163	109 Herculis	10.1	19	21.7	− 138.1	+ 169.6
164	Σ 2322	11.0	25	4.0	+ 4.0	− 19.7
165	29 Scuti	9.4	26	− 10.8	− 11.6	− 2.5
166	α Lyrae	9.5	34	38.7	+ 16.1	− 49.9
167	Σ 2396	10.8	44	10.6	− 17.8	+ 24.5
168	Σ 2400 A, B C	11.2 11.4	44	16.1	− 0.3	− 2.9
169	ν Lyrae	10.1	46	32.4	+ 49.6	− 31.4
170	ο Draconis	8.0	50	59.3	− 14.7	+ 28.8
171	11 Aquilae	9.3	54	13.5	− 16.7	− 1.4
172	223 Draconis	9.2	56	62.3	+ 14.2	− 9.6
173	31 Aquilae A B	8.4	19 20	11.7	− 22.3	+ 108.4
174	31 Aquilae B C	9.5	20	11.7	− 40.7	− 12.6
175	21 B. Vulpeculae	11.0	21	24.7	+ 29.5	+ 5.7

No.	Centennial Motions, 1850						Authority
	Bright *		Bright *–Faint *		Faint *		
	A′	D′	A′	D′	A′	D′	
			″	″			
151	− 3.93	− 1.42	+ 0.89	+ 0.76	....	....	C
152	− 1.72	+ 0.11	− 10.78	− 10.23	− 12.50	− 10.12	C
153	+ 5.73	− 2.32	− 6.76	+ 2.58	− 1.03	+ 0.26	N
154	− 2.68	− 15.80	− 7.97	+ 16.21	− 10.65	+ 0.41	N
155	+ 11.55	− 104.76	− 12.53	+ 101.88	− 0.98	− 2.88	N
156	+ 3.04	− 4.21	− 0.15	+ 2.24	?	?	C
157	+ 5.27	− 26.80	− 4.41	+ 25.71	+ 0.86	− 1.09	N
158	+ 1.15	− 1.30	− 0.31	− 0.19	?	?	N
159	+ 22.59	− 109.72	− 22.38	+ 108.11	+ 0.21	− 1.61	C
160	+ 22.59	− 109.72	− 21.55	+ 109.26	+ 1.04	− 0.46	C
161	+ 22.59	− 109.72	− 20.65	+ 110.00	+ 1.94	+ 0.28	C
162	− 57.12	− 68.81	+ 54.63	+ 68.44	− 2.49	− 0.37	N
163	+ 19.12	− 26.28	− 19.34	+ 23.91	− 0.22	− 2.37	N
164	− 2.09	− 1.88	+ 0.88	− 0.34	?	?	C
165	+ 0.03	− 1.75	+ 0.70	− 0.52	?	?	C
166	+ 21.02	+ 27.86	− 19.95	− 28.72	+ 1.07	− 0.86	N
167	+ 10.98	− 50.44	− 12.12	+ 44.62	− 1.14	− 5.82	C
168	− 3.30	+ 4.60	+ 3.04	− 6.48	− 0.26	− 1.88	C
169	− 4.17	+ 0.30	− 0.18	+ 1.40	?	?	C
170	+ 8.91	+ 2.22	− 9.34	− 0.61	− 0.43	+ 1.61	N
171	− 0.58	− 12.80	− 0.47	+ 11.05	− 1.05	− 1.75	C
172	− 2.41	− 3.65	+ 0.42	− 0.63	....	....	C
173	+ 73.00	+ 63.01	− 69.29	− 71.60	+ 3.71	− 8.59	N
174	+ 3.71	− 8.59	− 3.30	+ 7.96	+ 0.41	− 0.63	N
175	− 18.66	− 63.20	+ 18.16	+ 61.20	− 0.50	− 2.00	N

No.	Bright Star	Mag.	1900 R. A.	1900 Dec.	1900 A	1900 D
			h m	°	"	"
176	Σ 2521	10.2	19 23	19.7	+ 53.1	+ 19.5
177	Σ 2532	10.1	25	2.7	+ 2.9	+ 33.6
178	σ Draconis	10.0	33	69.4	− 101.0	+ 293.6
179	ϑ Cygni	11.3	34	50.0	− 2.7	− 42.1
180	17 Cygni A C	8.3	43	33.5	+ 90.4	− 112.5
181	α Aquilae	9.9	46	8.6	− 128.0	+ 96.2
182	Σ 2619 A C	12.0	58	48.0	− 12.5	+ 10.6
183	15 Sagittae A C	9.0	20 0	16.8	− 196.5	+ 13.8
184	15 Sagittae C D	8.5	0	16.8	− 143.2	− 115.1
185	σ 683	9.1	28	48.9	− 59.9	+ 9.2
186	ω² Cygni	9.7	28	48.9	− 34.2	+ 45.3
187	β Delphini A C	12.0	33	14.2	+ 22.5	+ 12.1
188	β Delphini A D	10.8	33	14.2	− 17.7	+ 32.4
189	κ Delphini	11.6	34	9.7	− 12.3	+ 8.7
190	Σ 2708	8.7	34	38.3	− 13.6	+ 23.9
191	ε Cygni	12.2	42	33.6	− 32.8	+ 22.5
192	λ Cygni A B, C	8.9	44	36.1	+ 82.0	− 22.5
193	56 Cygni	11.0	46	43.7	+ 55.4	+ 53.6
194	59 Cygni	9.2	56	47.1	− 2.6	+ 20.1
195	61 Cygni A B, C	10.1	21 2	38.2	− 64.6	− 262.1
196	Σ 2760	8.2	3	33.7	− 4.6	− 4.4
197	δ Equulei	10.0	10	9.6	+ 13.4	+ 40.8
198	τ Cygni A B, C	9.0	11	37.6	− 82.2	− 114.0
199	1 Pegasi	8.4	18	19.4	− 27.1	+ 24.0
200	μ Cygni A C	6.7	40	28.3	+ 169.0	+ 118.9

No.	Centennial Motions, 1850						Authority
	Bright *		Bright *–Faint *		Faint *		
	A″	D′	A′	D′	A′	D′	
			″	″			
176	− 3.33	− 8.27	− 0.50	+ 4.12	....	....	C
177	− 2.44	+ 0.26	− 0.22	− 1.58	?	?	C
178	+ 53 25	− 176.08	− 54.39	+ 175.40	− 1.14	− 0.68	C
179	− 2.06	+ 25.07	+ 0.95	− 26.45	− 1.11	− 1.38	N
180	+ 0.79	− 44.97	− 2.11	+ 43.86	− 1.32	− 1.11	C
181	+ 53.72	+ 37.54	− 53.67	− 38.21	+ 0.05	− 0.67	N
182	− 12.30	− 10.77	+ 11.39	+ 8.35	− 0.91	− 2.42	C
183	− 40.06	− 40.77	+ 38.62	+ 40 08	− 1.44	− 0.69	C
184	− 1.44	− 0.69	+ 0.75	+ 0.61	− 0.69	− 0.08	C
185	− 2.04	− 0.47	− 0.24	− 0.57	?	?	C
186	+ 1.37	− 3.31	+ 2.68	+ 5.22	?	?	C
187	+ 11.84	− 3.56	− 11.03	− 0,48	+ 0.81	− 4.04	N
188	+ 11.84	− 3.56	− 12.07	+ 1.75	− 0.23	− 1.81	N
189	+ 31.42	+ 1.50	− 30.16	− 2.52	+ 1.26	− 1.02	N
190	+ 18.55	− 18.26	− 17.74	+ 19.14	+ 0.81	+ 0.88	C
191	+ 36.87	+ 32.43	− 38.22	− 33.04	− 1.35	− 0.61	N
192	+ 1.07	− 0.57	− 0.83	− 0.55	?	?	N
193	+ 13.40	+ 13.16	− 12.20	− 15.03	+ 1.20	− 1.87	C
194	+ 1.61	− 0.55	− 0.04	− 0.04	....	....	N
195	+ 415.38	+ 313.57	− 412.87	− 312.42	+ 2.51	+ 1.15	N
196	− 1.79	− 3.97	+ 6.56	+ 7.57	+ 4.77	+ 3.60	C
197	+ 4.84	− 31.02	− 5.61	+ 29.10	− 1.27	− 1.92	C
198	+ 16.93	+ 43.27	− 16.60	− 43.96	+ 0.33	− 0.69	N
199	+ 10.67	+ 6.33	+ 0.25	+ 0.16	....	....	N
200	+ 28.82	− 24.66	− 29.30	+ 18.59	− 0.48	− 6,07	C

No.	Bright Star	Mag.	1900 R. A.	1900 Dec.	1900 A	1900 D
			h m	°	"	"
201	κ Pegasi	10.6	21 40	25.2	— 10.8	+ 6.0
202	100 Aquarii	9.0	49	— 3.8	— 1.5	— 19.6
203	15 Cephei A B	10.8	22 1	59.3	— 9.6	+ 5.1
204	15 Cephei A C	9.5	1	59.3	+ 56.9	+ 69.2
205	ι Pegasi	11.1	2	24.8	— 65.0	— 78.7
206	Σ 2877	9.2	10	16.7	+ 0.3	+ 11.8
207	33 Pegasi A C	8.0	19	20.4	— 38.2	+ 54.5
208	10 Lacertae	8.7	35	38.5	+ 46.3	+ 40.1
209	O Σ 477	11.2	39	45.5	— 1.3	— 4.3
210	Σ 2944 A C	8.4	43	— 4.8	+ 35.4	— 31.2
211	Arg 528	9.7	46	13.4	— 72.6	+ 185.4
212	16 Lacertae A B	11.7	52	41.1	— 6.9	+ 26.4
213	16 Lacertae A C	9.0	52	41.1	+ 46.4	+ 42.1
214	O Σ 536	9.5	54	8.8	+ 242.0	+ 21.7
215	β Pegasi	9.4	59	27.5	+ 255.2	— 32.6
216	57 Pegasi	10.3	23 4	8.1	— 4.9	— 15.5
217	60 Pegasi	8.6	7	26.3	— 212.2	+ 94.7
218	Arg 540, 5 H Cassiopiae	8.8	8	56.6	— 31.1	— 92.0
219	ψ Aquarii	8.7	11	— 9.6	— 36.9	+ 33.2
220	λ Andromedae	10.4	33	45.9	+ 218.5	0.0
221	Σ 3041 A, B C	8.3 8 5	43	16.5	— 10.2	+ 65.6
222	85 Pegasi	8.5	57	26.6	— 9.4	+ 33.8

No.	Centennial Motions, 1850						Authority
	Bright *		Bright *–Faint *		Faint *		
	A′	D′	A′	D′	A′	D′	
			″	″			
201	+ 3.81	+ 1.25	− 3.24	− 1.23	+ 0.57	+ 0.02	N
202	− 0.93	+ 0.18	+ 0.54	+ 2.84	?	?	C
203	+ 2.50	− 1.03	+ 0.29	+ 0.10	?	?	C
204	+ 2.50	− 1.03	+ 3.56	− 1.52	+ 6.06	− 2.55	C
205	+ 30.26	+ 1.94	− 30.12	− 3.78	+ 0.14	− 1.84	N
206	− 10.42	− 9.79	+ 8.12	+ 8.69	− 2.30	− 1.10	C
207	+ 33.56	− 1.60	− 31.81	+ 0.43	+ 1.75	− 1.17	C
208	+ 1.34	− 1.13	+ 0.90	− 0.31	?	?	N
209	+ 17.48	− 0.57	− 17.56	+ 1.52	− 0.08	+ 0.95	C
210	− 19.12	− 30.47	+ 20.81	+ 29.97	+ 1.69	− 0.50	C
211	+ 42.89	+ 21.00	− 32.54	− 14.56	+ 10.35	+ 6.44	C
212	+ 0.32	+ 0.08	+ 0.73	− 0.07	....	....	C
213	+ 0.32	+ 0.08	− 0.58	− 1.73	− 0.26	− 1.65	C
214	+ 38.42	− 15.23	− 38.35	+ 14.81	+ 0.07	− 0.42	C
215	+ 19.40	+ 13.46	− 16.52	− 15.14	+ 2.88	− 1.68	N
216	− 0.12	+ 0.53	+ 0.50	− 0.08	?	?	C
217	− 19.54	− 12.11	+ 18.93	+ 10.70	− 0.61	− 1.41	C
218	+ 208.75	+ 29.49	− 206.36	− 28.89	+ 2.39	+ 0.60	N
219	+ 36.92	− 0.58	− 0.50	− 0.39	....	....	N
220	+ 16.42	− 42.03	− 10.52	+ 40.85	+ 5.90	− 1.18	N
221	+ 7.52	− 6.38	− 7.50	+ 5.81	+ 0.02	− 0.57	C
222	+ 83.99	− 98.49	− 83.50	+ 97.89	+ 0.49	− 0.60	C

NOTES TO TABLE V.

5. 42 Piscium.

The meridian observations of 42 Piscium are not well represented by the assumed proper motion. Possibly a case of variable proper motion.

13. μ Cassiopeiae.

According to Ristenpart, V. J. S. 39, 199, the motion of μ Cassiopeiae is not linear.

21. v Andromedae.

There is almost certainly an error in the position assigned to the *comes* on one of the dates employed. From the meridian observations it appears probable that this error is O. Struve's observation of 1882, which enters with comparatively little weight into the resulting motion of the star.

22. Σ 142.

Burnham considers this a case of proper motion, and it may well be such, although I am not entirely convinced of the fact and have not employed the resulting A′ D′ as proper motions.

37. A′ Tauri.

I have added 180° to the printed position angles of $O\,\Sigma$ and Doubiago.

40. 40 Eridani, A B.

From the A coordinates I find for the ratio of the masses in this system $k = +0.46$ and from the D coordinates $k = +0.40$. Adopting the mean of these values we have $A:B = 57:43$ with which the residuals have been formed. The distribution of these outstanding errors is more satisfactory than their magnitude, but in view of the difficulty of the observations and the considerable personal peculiarities shown by some observers, e. g., Hall, there is little reason to regard these as presenting any other than an accidental character.

66, 67, 68, Procyon.

This star and the following one were employed by Otto Struve for an investigation of the irregular proper motion of Procyon. A discussion of his results by L. Struve may be found in Astr. Nachr. No. 3108. I have supplemented Struve's data by measuring differences of declination, substantially after his method, and adopting from L. Struve the elements of the orbit of Procyon I have applied to all of the data corrections for this orbital motion. The corrected places, together with Newcomb's proper motion of Procyon, have then been used for a determination of the motions of the faint companion stars.

74. 29 Monocerotis.

This is probably a triple system but a somewhat remarkable one in that the apparently more distant satellite, C, moves more rapidly than the nearer one, B. I find for the values of the double areal velocity, $s^2 \frac{dp}{dt}$, + 11″.9 and + 48″.1 per century for B and C respectively. The corresponding apparent distances are 32″ and 66″

77. Arg. 167 = Pi. VII, 341.

The residuals in A suggest a variable proper motion for this star. The discordances may, however, arise from fortuitous error in two isolated observations by O. Struve.

83. 10 Ursae Majoris A C.

Probably an error in one of the $O\Sigma$ measures.

γ Leonis, A C.

See a note relative to this star in Flammarion, Étoiles Doubles, p. 58,

θ Bootis.

All of the Pulkowa distances of this star are assumed to be wrongly printed. The first figure should be 6 instead of 9. This error has been independently noted by Burnham.

142. σ Coronae.

Newcomb gives the proper motions of the following member of this binary system. To reduce these to the center of gravity of the systrm I obtain from Burnham's apparent orbit, Gen. Cat. Double Stars, the apparent motion of B relative to A in the interval 1837–1902, i. e., p = 133°.5, s = 6″.88. Transforming this motion into rectangular coordinates, A′, D′, I assume that one-half of these quantities may be used as the required reduction.

145. ω Herculis.

Newcomb's proper motions of this star appear to be erroneous. I have adopted Auwer's values reduced to Newcomb's value of the precession constant.

152. Σ 2120.

The character of the motion of this star, whether orbital or no, has been debated by Otto Struve and Dunèr. I have therefore discussed an unusual number of observations in this case and find that the residuals furnish no indication of curvature in tne path. The stars may be assumed to have no physical connection.

160. 70 Ophiuchi.

Each catalogue place of the star furnishes an equation of the type shown in Eq. 5, p. 8, and from a discussion of thirty catalogue places included between the epochs 1755 and 1907 I find for the mass ratio,

From R. A. $k = +0.46$ From Dec. $k = +0.51$

The form and position of the apparent orbit of the binary star are such as to make the right ascension a little better adapted to the determination of k than is the declination, and with due regard to this condition the most plausible value of k probably lies between 0.48 and 0.49, but in view of the character and amount of the data we may substitute for this most plausible value a round figure, 0.5, and thereby assume the components of 70 Ophiuchi to be of equal mass. With this value of k I have formed for each coordinate the sum of the weighted squares of the residuals. $[pvv]$, and have also formed the corresponding quantity for the case in which k is neglected and the proper motions determined in the usual way. I find thus

For	k = 0.5	k = 0.0
$[pvv]$ in R. A.	$0^s.243$	$0^s.592$
$[pvv]$ in Dec.	$16''.6$	$58''.3$

The substantial diminution of the residuals produced by taking into account the orbital motion of the star is here very apparent, but it should be added to the foregoing exhibit that a similarly marked improvement is produced in the distribution of the residuals with respect to sign, particularly in right ascension. From the $[pvv]$ thus formed I obtain for the probable error of an equation of unit weight

For	k = 0.5	k = 0.0	Normal
r_1, in R. A.	$\pm\ 0^s.064$	$\pm\ 0^s.098$	$\pm\ 0^s.061$
r_1, in Dec	$\pm\ 0''.52$	$\pm\ 0''.99$	$\pm\ 0''.54$

The last column shows the normal values of r_1 as furnished by a discussion of more than 100 other stars. The abnormal values of this quantity obtained when k is put equal to 0 point to the presence in 70 Ophiuchi of a special disturbing element which we may regard with considerable confidence as the orbital motion.

The three small stars compared with 70 Ophiuchi were at first discussed without reference to the orbital motion of the binary, using Newcomb's proper motions of the latter. This treatment led to intolerable discordances among the observations and to the following improbable values of the motions of the faint star, third and fourth columns of the table:

Star	Mag.	Centennial Proper Motion.			
		R. A.	Dec.	R. A.	Dec.
		$''$	$''$	$''$	$''$
a	12.5	+ 7.95	− 9.14	− 0.24	− 1.61
b	12.8	+ 6.38	− 9.32	+ 0.59	− 0.46
c	11.8	+ 6.30	− 12.71	+ 1.49	+ 0.28

After making the investigation of the proper motion of 70 Ophiuchi, above outlined, the observations of the small stars were again discussed, referring their position to the center of gravity of the system and taking into account an assumed annual parallax of 0".18 in the bright star. The results of this discussion were even more discordant than the original one and seemed to indicate a large error in Hall's observation of 1878. I am unable to find in connection with this observation any statement as to which component of the binary star was compared with the faint stars a and b, and in order to remove, if possible, the discordance presented by this obser-

vation I have abandoned my original assumption that the comparison was with A and have tried reducing the observations upon the snpposition that B is the star here involved, while A was observed in subsequent years. The result is a marked diminution in the residuals presented by the entire series of observations and also the elimination of the suspicious character of the proper motions of the faint stars, the resultant motions being as shown in the last two columns of the preceding table. I adopt these results as definitive.

If we may assume the mean of these three twelfth magnitude stars to have no sensible motion the mean of the above values, giving half weight to C, furnishes the following corrections to the centennial proper motions of the center of gravity of 70 Ophiuchi as determined from the meridian observations

$$\Delta\mu = +0''.44 \qquad \Delta\mu' = -0''.77$$

While I should regard it as entirely improper to use these corrections to improve the values given by the meridian observations they may serve as a substantial confirmation of the latter.

166. α Lyrae.

An assumed parallax of $+0''.14$ has been taken into account in the reduction of observations of this stae.

182. Σ 2619 A C.

My note books designate this as an extraordinarily difficult star to measure. Possibly variable.

195. 61 Cygni.

Newcomb's proper motions of this star refer to the brighter component, A. They have been reduced to the point ½ (A + B) by applying to them one-half of the relative motion in the system as read from Burnham's figure, Gen. Cat. Double Stars. An assumed parallax of 0.30″ has been taken into account in the reductions.

219. ψ Aquarii.

The unusually large residuals furnished by the micrometric observations of this star suggest an irregular proper motion, possibly orbital with a period of 35 years.

222. 85 Pegasi.

The determination of the proper motion of the faint star, C, is here complicated by the probable orbital motion of the comparison star, the bright component, A, of 85 Pegasi. The observations of this star, extending over a complete revolution of the binary system, suffice for a very good determination of the relative masses of the components. I have published the results of suce an investigation in the Astronomical Journal, Vol. XVII, p. 220, which may be briefly summarized as follows:

By the method indicated in the Introduction I find

From the A coordinate	k = + 0.60
From the D coordinate	k = + 0.63

The excellent agreement of these values tends to inspire confidence in them as genuine determinations of a physical reality, but to further test the matter I have taken as a mean result k = 0.616 and with it formed the sum of the weighted squares of the residuals for the entire series of observations, both coordinates. I have also formed $[pvv]$ for k = 0, and including the

bracketed residual in each case, find for these quantities and the corresponding probable error of a single equation

For	$k = 0.616$	$k = 0$
$[pvv]$	$3''.04$	$5''.44$
r_1	$\pm\ 0''.15$	$\pm\ 0''.20$

The smaller value of r_1 is in excellent agreement with the average probable error of a single equation elsewhere determined, while the larger value, for $k = 0$, implies the presence of an influence making the observation of this star considerably less precise than is usually the case, e. g., orbital motion. I therefore adopt the mean value, $k = 0.616$ and from it find for the ratio of the masses of the components of 85 Pegasi

$$A ; B = 20 : 32$$

i. e., the star that emits only 1–200 part of the light of its companion has a mass of 60 per cent greater than that of the latter.

ERRATA.

Page 11, line 2 from bottom. For Table I read Table II.

Page 114. Star 52. For ϑ° read ϑ'.

" Star 53. For $'$ read ϑ'.

PUBLICATIONS

OF THE

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OF THE

UNIVERSITY OF WISCONSIN

VOL. XII, PART 2

MERIDIAN OBSERVATIONS OF COMPARISON STARS

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ASTRONOMER.

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The Washburn Observatory.

FOUNDED BY

Cadwallader C. Washburn.

Born 1818; Died 1882.

INTRODUCTION

PURPOSE OF THE WORK

The observations whose results are here presented were undertaken at the request of Professor GEORGE C. COMSTOCK, Director of this observatory, in order to determine recent positions for certain stars involved in his investigations concerning the proper motions of fainter stars. The period of observation, for the main body of the work, extended from October 19, 1903, to May 22, 1905; but a few additional observations were made on five nights, from July 28 to August 7, 1907, to determine the position of 70 (a) Ophiuchi at 18^h 0^m of right ascension. These last results have been incorporated in the present work although only four standard stars, besides the circumpolar δ Ursae Minoris, were observed on each night with 70 Ophiuchi. The four stars observed on each night were disposed nearly symmetrically with reference to 70 Ophiuchi. The total number of stars observed was 259, of which 67 were proper motion stars and 192 were standard stars. The mean results are given in Table IV following.

INSTRUMENT AND APPARATUS EMPLOYED

The instrument employed was the REPSOLD meridian circle of 12.2 cm. aperture, which had been equipped in 1897 with a Repsold transit micrometer. The instrument was still in use in the second series of observations of meridian transits for stellar parallaxes, but that work was approaching completion and no longer needed the utilization of all clear nights. For the usual and normal observation in the present work the telescope was clamped at approximately the same reading of the microscopes for each star. The star image was bisected in declination upon the single horizontal thread at one of the two preceding fixed vertical threads and again at the corresponding following vertical thread. In the middle part of the transit the image was bisected on a single one of the movable vertical threads and followed a sufficient distance to secure more than twenty signals upon the chronograph.

The wire screens described in Vol. XI, p. 2, Publications of the Washburn Observatory, were employed to reduce the apparent magnitudes of the brighter stars; but the slat screen, in frequent use in the parallax work, remained attached to the object end of the telescope and was kept wide open. While the observer had had a brief preliminary experience several years before in making declination pointings upon the central image of the vertical diffraction system formed by turning the slats upon a bright star, it did not seem advisable to change at this time to so novel an object of observation for a work which was not expected to occupy much time and attention.

A brief account of the transit micrometer and of the slat screen may be found in the *Astronomical Journal*,, No. 470, and the maker's own description of the former, with plate, in the *Astronomische Nachrichten*, No. 3377; but since the present work is the first to be published at this observatory involving the new micrometer, it seems proper to give some description thereof and further notes in this place.

THE REPSOLD TRANSIT MICROMETER

So far as its employment in pointing upon star images is concerned, the new micrometer is the same in construction as the ordinary micrometer, except that in right ascension an auxiliary screw is provided, parallel to the right ascension screw and connected with it by means of gears. This auxiliary screw is turned by means of two circular heads fixed to the ends of the screw, an arrangement which favors balance in manipulation and enables the observer to maintain bisection upon a moving star-image with one hand while moving the other hand backward for its next turn. The auxiliary screw also works through a nut connected with the slide carrying the ocular, so that the latter is moved along also and is kept in a constant position relative to the movable threads. One turn of the auxiliary screw makes three turns of the micrometer screw and moves the thread over an interval of 18.9 seconds of time at the equator. The micrometer screw has the ordinary head, graduated to hundreths of a revolution, and fixed to this head a second head which carries in its circumference a series of ten small platinum plates set at the exact tenths of a revolution. These plates pass under a contact bar, as the screw is turned, so that automatic electric signals are made upon the chronograph. Two extra plates are set close together opposite the zero of the micrometer head, so that a triple signal marks the beginning of each revolution on the chronograph. Naturally the number of fixed vertical threads is reduced from the customary number, and only five are mounted in the micrometer. The equatorial intervals from the middle thread are as follows:

$$+27^{s}.10 \qquad +17^{s}.16 \qquad 0^{s} \qquad -17^{s}.03 \qquad -26^{s}.98$$

The movable threads consist of a set of three, one single thread preceding, Circle East, and a close pair following. The former is distant 0.3369 rev. or 31″.8 from the mean of the pair or at an interval of $2^{s}.12$ at the equator. The distance apart of the pair of threads is 0.1160 rev. or 10″.9, which is $0^{s}.73$ at the equator. It has seemed, in the experience of the present observer, unsatisfactory to attempt to maintain a pointing with a single thread upon the image of a fainter star which may hide entirely behind the spider thread, even the finest; and the temptation is strong to point instead on the star in bisection of the space between the pair of threads, even at the risk of somewhat increased error. However, all the present observations have been made with the single thread; but on a few dates, as specified in the notes to Table III, the star-images were kept on the edges of the thread, on the preceding edge during the first half and on the following edge during the second half of the observation. This was done because some coarser threads were temporarily in use after the original threads had become loose and had been taken out.

The performance of the micrometer has been in general very satisfactory. The following notes and suggestions occur in consequence of the experience of the present observer.

The comparatively slow speed of the driving heads, 18.9 seconds of time for one turn, has not been found inconvenient. This speed is very different from that of 4.8 seconds recommended by Mr. JOHN F. HAYFORD for the instruments of the United States Coast and Geodetic Survey (Report, 1904, App. No. 8).

The length of a single signal on the chronograph for an equatorial star is frequently less than 1 mm., while that of a clock signal cannot safely be made less than 1 mm. under the most favorable circumstances. The star signals then may be entirely lost in the clock signals, unless separate lines can be devoted on the chronograph to star and clock signals respectively. It would seem advisable to make the contact plates on the micrometer much longer.

Great care should be taken in setting the contact plates in the micrometer head to secure uniformity of pressure. In this instrument, as the adjustment is made more free, the triple signals at the zero are the first to disappear, followed by the adjacent signals at nine tenths and one tenth of a revolution, while the remainder will continue to record perfectly.

The contact bar is of brass, fixed at one end and free at the other, and carries the contact plate at its free end 32 mm. from the support, The screw for adjusting the pressure of the free end of the bar upon the rotating head which carries the series of contact plates, is 20 mm. from the free end. The bar is 2.5 mm. wide and 1 mm. thick. The bar seems too rigid and the adjusting screw not quite delicate enough. The latter has 32 threads to one centimeter, but would be better to have at least 50 threads to one centimeter. The head of the adjusting screw is 79 mm. in diameter. This was made to replace the very small original head and would be better to be even larger.

The driving heads are of celluloid with smooth circumferences. These would be better if milled so as to allow a more secure hold when the fingers are cool and dry. The practice of the present observer has been to put a little powdered rosin on the finger tips.

This instrument has also a device for recording bisections in declination for subsequent reading. A short graduated arc is placed beside the head of the ordinary declination micrometer, and a strip of paper is stretched between two rollers so that it may be moved along under the arc and transversely to the length of the arc. A lever clamped to the axis of the micrometer travels between the arc and a curved bar parallel to the arc and placed above. The bar, when pressed down by the observer, causes the lever to prick a plain mark upon the paper. This action also closes an electric circuit so that the time may be recorded upon the chronograph. A mirror and lens over the arc enable the observer to read the record conveniently. The extent of the arc is only 14″, so that the operation of the micrometer in a given position of the telescope is limited within this range. The head for turning the micrometer is at the end of a short horizontal axis, at the side of the micrometer box opposite the graduated head of the right ascension screw, and is connected by bevel gears with the axis of the declination screw. The eye piece has no motion in zenith distance.

Some experiments were made by the present observer employing this device for securing the record of pointings upon star images. The pressure required upon the bar to make the mark on the paper strip made a visible and uncomfortable disturbance of the telescope; but the instrument appeared to return at once to its normal position, inasmuch as the probable error of a single reading was the same as when the micrometer head was read directly. The normal probable error, $\pm 0''.27$, of a single observed declination in the present work matches very closely the normal probable error of a single observed right ascension at the equator, $\pm 0^s.019$. Only two bisections were made in declination on each star, and these were read directly from the micrometer head and recorded by the observer working alone. The full advantage of the device would be gained only when the strip of paper could be removed from the instrument and the positions of the marks read off at convenience, as are the signals on the chronograph. As the strip of paper is liable to a little slip sidewise, a continuous zero mark should be maintained in some way. This might be done by means of a pin set in a fixed position with reference to the graduated arc. Or, the same purpose conld be effected, at more trouble, by reading off both arc and micrometer head for one of the bisections on each star. Even with a large inclination of the thread, however, the marks are liable to be confused and lost in one another.

The driving screw of the right ascension micrometer may be disconnected and the pricking lever may be unclamped and left loose on the axis of the declination micrometer, which gives the latter free play in the field. This makes the operation of the whole the same as that of the ordinary micrometer.

CONDITIONS UNDER WHICH THE OBSERVATIONS WERE MADE.

One change had been made about the observing room before the second series of parallax observations and the present observations were begun. The attic loft, referred to in Vol. XI, page 10, was shut out from the opening over the instrument and under the roof shutters by means of board partitions built from the ceiling of the room to the roof. Ventilation was secured during the day by means of four doorways, two for each of the divisions of the loft, east and west. These were closed before observations were begun, and then the only means of ventilation were the series of small holes bored through the cornice (Vol. II, p. 11). This change seemed to reduce greatly the disturbance of the images of stars near the zenith. Otherwise the conditions about the instrument remained the same as described in Vol. XI, page 2.

The instrument remained in position, Circle East, throughout the present observations except for the last two nights of observation on 70 Ophiuchi, when the circle was West. The former position was that in which all the previous observations in the parallax work had been made; and, since the intention was to make the present work closely differential, there seemed to be no adequate reason for disturbing the existing conditions. The method of observation and reduction is such, making the resulting position of each star depend so closely upon its neighboring standard stars, that any sensible difference as compared with observations made

Circle West, is extremely improbable. No data have been previously obtained with this instrument which are strictly comparable with the present observations, either in right ascension or in declination, and upon which an estimate might be based as to the systematic difference which might be expected in the present work.

ESTIMATES OF THE REDUCTION OF APPARENT MAGNITUDE EFFECTED BY MEANS OF THE WIRE SCREENS.

In 1893–1896 the effect of the wire screens in reducing the apparent brightness of stars was adopted as 2.5 and 5.0 magnitudes for screens I and II, respectively (Vol. XI, p. 3). A new attempt was made to determine these constants from the present work with a result that there appears to have been a noticeable change in the observer's estimates during the period of observation, so far at least as screen I was concerned. For the comparisons in the present work only those observations were taken for which the seeing was estimated at 4 or better on a scale from 0 for the worst to 5 for the best, and the observer's estimates of the reduced magnitudes were compared only with the Potsdam Photometry. The results of the comparisons are presented in the following table:

SCREEN I.

Period	Number of observations.	Mean of estimated magnitudes.	Mean estimated reduction by screen.	Mean residual.
1903, Oct. 26–Oct. 29	16	7.35	2.45	0 19
1904, Mar. 22–Apr. 6	11	7.35	2.86	.25
1904, July 1–July 12	23	7.03	3.07	.28
1904, Aug 10–Sept. 3	15	7.17	2.90	.27
1904, Nov. 15–1905, Feb. 22	16	7.20	2.78	.20

SCREEN II.

Period	Number of observations.	Mean of estimated magnitudes.	Mean estimated reduction by screen.	Mean residual.
1903, Oct. 26–1905, Feb. 22	21	7.59	5.11	0.15

No explanation appears for the apparent change after the first period. The bright field illumination was obtained throughout from the steady flame of an oil lamp, but the observer may have changed his habit unconsciously in the adjustment of the illumination. To attribute to the screen itself, from the gathering of dirt, the apparent diminution of light would mean an obscuration of the screen very nearly in the ratio of 4 to 7, which is inadmissible. The reductions by Screen II, which are well distributed over the entire time, indicate no change and their mean agrees

closely with that obtained in 1893–'96. In computing the mean apparent magnitudes of the stars as observed, $Mag._2$ of Table IV, the apparently different values of the reduction by Screen I are taken into account in combining with the catalogue magnitudes.

METHOD OF REDUCTION IN RIGHT ASCENSION AND EXPLANATION OF TABLE I.

The observations in right ascension were reduced in accordance with BESSEL'S formula

$$\alpha = T + r\,(T - T_0) + c''' \,.\, \sec\delta + n \,.\, \tan\delta + (\varDelta T + m)$$

where we have

r = the assumed rate of the clock
T_0 = the epoch of $\varDelta T + m$
c''' = the sum of the instrumental collimation and all correction terms which are to be multiplied by sec δ,

and the remaining symbols have their ordinary signification.

The instrumental collimation was determined in general by means of the level and nadir, but on several dates the coincident collimators were employed.

The standard position of the micrometer was adopted as 7.05 revs. in computing the time of transit of each star from the chronograph signals; and the measured collimation was that of the standard movable thread when the reading of the micrometer head was 7.05 rev. by the index. But this is not exactly 0.05 rev. distant from the position occupied by the thread when thc 7.00 rev. signal is made automatically on the chronograph. From a number of observations of the reading of the index, when the closing of the electric contact was indicated by a sounder placed near the instrument, it was found that the mean difference was + 0.0057 rev., Circle East, and + 0.0077 rev., Circle West. This was applied as a correction to the measured collimation, as shown in the following.

Another term combined with the collimation constant, but varying in effect with the different stars, was the inclination of the standard movable thread. This effect would depend upon the reading of the zenith distance micrometer and be of the form

$$\varDelta c = \pm\, k\,(9.5 - M') \begin{matrix}\text{Circle East}\\ \text{Circle West}\end{matrix}$$

Considerable trouble occurred with the movable threads in the course of the observations, and finally, in December, 1904, an entirely new set of fine threads were put in very skilfully by Mr. H. G. FISCHER, mechanician of the department of Physics in the University. Observations made from time to time upon the collimator resulted in the following adopted values of the constant k.

1903, Oct. 19 — 1903, Nov. 2	k = + $0\overset{r}{.}0021$
1904, Jan. 6 — 1904, Jan. 13	— .0029
1904, Feb. 24 — 1904, Nov. 4	— .0022
1904, Nov. 11 — 1904, Nov. 15	— .0006
1905, Jan. 3 — 1905, May 22	— .0044

Finally, where a transit was observed unsymmetrically, which occurred in some cases systematically where stars came close together, still another term, reduction to middle, was combined with the collimation.

The constant c''', therefore, of the formula was composed in general of four terms, and in a number of cases of five terms, as follows:

c''' = Inst. Coll. + Diur. Abb. + Contact Correction + Inclination + Reduction to Middle.

Or, employing the corresponding numbers and symbols,

$$c''' = c - \overset{r}{0}.0024 \begin{matrix} +\overset{r}{0}.0057 \\ +0.0077 \end{matrix} \pm k\,(9\ 5 - M') \pm (7.05 - M) \begin{matrix} \text{Circle East} \\ \text{Circle West} \end{matrix}$$

where M and M' denote the mean reading of the right ascension micrometer and the approximate reading of the declination micrometer respectively.

In Table I are presented the values of the instrumental constants as employed in the reduction of the observations for right ascension.

In the *first* column is given the date of observation, including the tenth of a day at the beginning of the night's work, and in the *second* column the epoch of $\Delta T + m$.

In the *third* column is given the value of the level constant, usually the mean of two or more observed values as indicated by the numbers in the *fourth* column. The level determinations were not employed in the reductions except the one value observed and employed in connection with a nadir determination of the collimation. The value of one half of a division of the level, *R* 58367, is $0^s.04245$ or 0.006746 revs. of the right ascension micrometer. While the instrument is subject to large variations in its level constant from time to time, the values observed through the course of several hours on any one night seem fairly consistent. The probable error of a single determination of the level constant, from one symmetrical set of eight readings, computed from all the determinations in the present work, is $\pm\ 0^s.0164$. This was computed by PETERS' formula from 146 determinations on 37 nights; and the residuals were derived from the simple means of the several determinations on each date without any allowance for systematic change.

In the *fifth* column is given the collimation constant c'', including the first three terms of the expression for c''' given in the preceding, and in the *eighth* column a number indicating the number of standard circumpolar stars that were observed and employed in determining the n constant. The agreement of the several values of the constant determined on each date was in general very good, and, with the exception of one date, the value given in the column n is the simple mean for each date. On March 22, 1904, however, there was a marked progression in the four determinations. These were plotted, and an hourly variation of $+0^s.0086$ was derived from a straight line drawn among the plotted points.

In the *eleventh*, the last column, is given the hourly rate of change in $\Delta T + m$ beyond the value of the adopted clock rate. This was derived from the series of values resulting from the observed clock stars. A parenthesis indicates an approximate value derived from a straight line drawn among the plotted points, although the

values adopted in the reductions for the date in question were read from a curved line. The sum of the numbers in the *sixth* and last columns would be the total hourly variation of $\Delta T + m$ as indicated by each night's observations.

A cross line in the column of any constant indicates that, after the last preceding date, the instrument had been adjusted as affecting that constant.

The adopted value of the right ascension micrometer is $6^s.2923 \pm 0^s.00045$, and was derived from the transits of 19 stars of various declinations between 0° and 78°, observed in March–May, 1901, and January, February, 1903.

METHOD OF REDUCTION IN DECLINATION AND EXPLANATION OF TABLE II.

The observed declinations are referred solely to the ephemeris places of the standard stars. A reading of the equator point was computed from each observation of a standard star and a normal reading for each star observed was derived, as described in connection with Table II. The observed correction to the declination of a standard star on any date is the correction which must be applied to its particular reading for the equator point on that date in order to reduce to the normal reading for the equator point corresponding to the right ascension and the declination of the star.

With very few exceptions two micrometer pointings were made on each star; and, with comparatively few exceptions, these consisted of one bisection in the early part and one in the later part of the transit, preceding and following the observation in right ascension, which was made in the middle of the field.

Care was taken, in setting on the stars, to preserve a proper balance in the micrometer equivalents to be applied to the circle readings; that is, if upon setting on one division of the circle the image of a given star was found to cross at some distance from the center of the field in zenith distance, the setting on the next date of observation was made on the next 2′ division of the circle so as to bring the star image on the other side of the center. The adopted value of the micrometer, 94″.348 ± 0″.025, was derived from 34 intervals of about 2 revs. each, measured upon the collimator, March 3 and March 16, 1903.

There is a large inclination to the horizontal movable thread which was doubtless designed by the makers for the more convenient application of their device for recording bisections. This inclination was determined from the differences of the micrometer pointings made at threads I and V, the first and the last respectively of the fixed vertical threads. The adopted mean corrections were as follows:

1903, Oct. 19 — 1904, July 9. Correction at I, $-\overset{r}{0}.0098$; at V, $+\overset{r}{0}.0098$

1904, July 12 — 1905, May 22. Correction at I, -0.0104; at V, $+0.0104$

The corrections for inclination were applied directly to the mean of the micrometer readings in all cases of unsymmetrical pointings. The correction for Division Error and Flexure, given at page 31, Vol. VIII, was applied to each observation. The barometer and the thermometer were observed in the usual manner and the refractions were computed with the aid of the Pulcova tables.

In Table II are given certain data pertaining to the observed equator points as derived from the combination of the complete readings of the instrument with the ephemeris declinations. These equator points were plotted for each date with the circle readings as abscissae, and a right line or curve was drawn to represent them. The residuals of the plotted points, represented by their distances from this curve, were plotted in turn, this time making the right ascensions the abscissae. If these showed no systematic change with the time, the previous line or curve was adopted as representing the adopted values of the equator points. If, however, the second plot did show a systematic change, a right line or a curve was drawn to represent these residual points, and the sum of the ordinates of the two curves, corresponding respectively to the circle reading and the right ascension of the given star, was adopted as the true reading of the equator point for that star. As an example the data of November 11, 1904, may be presented here in full.

Standard star	Right ascension	Circle reading	Observed equator point	Residual from first curve	Residual from second curve	Ordinate of first curve	Ordinate of second curve	Adopted equator point
			348° 40′					
	h m	°	″	″	″	″	″	″
No. 1	1 12	345.6	20.7	− 0.4	0.0	21.00	− 0.50	20.5
2	1 40	340.0	0.7	− 0.6	− 0.2	1.10	− 0.40	0.7
3	2 2	325 7	0.4	− 0.7	− 0.3	1.10	− 0.30	0.8
4	2 23	340.6	1.2	0.0	+ 0.3	1.05	− 0.25	0.8
5	2 37	299.8	0.6	− 0.4	− 0.1	1.00	− 0.25	0.7
6	2 54	327.7	21.3	+ 0.1	+ 0.2	21.10	− 0.20	20.9
7	3 9	328.0	1.2	0.0	+ 0.1	1.10	− 0.10	1.0
8	3 36	301.2	0.2	− 0.8	[− 0.7]	1.00	0.00	1.0
9	3 54	362.5	0.1	− 0.6	[− 0.7]	0.55	+ 0.05	0.6
10	4 23	329.7	1.6	+ 0.4	0.0	1.10	+ 0.25	1.4
11	4 36	325.9	21.3	+ 0.2	0.0	21.10	+ 0.30	21.4
12	4 44	341.9	1.7	+ 0.6	+ 0.1	1.05	+ 0.35	1.4
13	4 55	307.7	1.5	+ 0.5	0.0	1.00	+ 0.40	1.4
14	5 20	342.4	1.8	+ 0.8	0.0	1.05	+ 0.55	1.6
15	5 43	358.4	1.2	+ 0.4	− 0.1	0.75	+ 0.50	1.2
16	5 58	325.4	21.4	+ 0.2	− 0.1	21.10	+ 0.45	21.6
17	6 9	326.1	1.2	0.0	0.0	1.10	+ 0.30	1.4
18	6 32	332.2	0.8	− 0.5	− 0.4	1.10	0.00	1.1
19	6 46	314.6	1.1	0.0	+ 0.1	1.05	− 0.05	21.0
20	6 56	261.5	0.0	0.0	+ 0.2	0.00	− 0.20	19.8
21	7 7	332.4	21.0	0.0	+ 0.3	21.10	− 0.35	20.8
				+ 3.2	+ 1.3			
				− 4.0	− 1.2			
			Sum	− 0.8	+ 0.1			

Among the residuals in the *sixth* column are two, those of stars Nos. 9 and 10, which were not given any sensible weight in drawing the second curve, since they stood so noticeably outside of a good alignment presented by all of the remaining stars. Of these two stars the first is δ Persei, which seems abnormally low in its observed value of the equator point on this date. The second is γ' Eridani, for which a mean correction of $+0''.56$ to the ephemeris was derived from the eight observations made on this star. This correction applied would nearly remove the residual in question.

In the *second* and *third* columns of Table II the headings E_1 and E_2 indicate the greatest and least values of the equator points respectively, as determined directly from the individual standard stars.

In the *fourth* column the letter m indicates that the simple mean of all the observed values was adopted as the equator point for the entire date. The letter r indicates that a right line was drawn to represent the observed equator points as plotted with circle readings as abscissae, and the letter c that a curve was drawn.

In the columns v_1 and v_2 are given the largest positive and negative residual errors respectively shown by the individual stars in the plot with circle readings as abscissae.

In the *seventh* column the letter m indicates that the first plot was adopted as final and the ordinates of its curve read off as the adopted equator points. But where the residual errors in the first plot, when arranged in the order of right ascensions, showed a systematic variation, the letters r and c in this column indicate, respectively, that a right line or a curve was drawn to represent this second plot.

In the columns v'_1 and v'_2 are given the largest positive and negative residual errors respectively shown by the individual stars in the second plot for a given date, that is, the plot with right ascensions as abscissae.

In the last column n is given the number of standard stars observed in declination on each date.

EXPLANATION OF TABLE III — INDIVIDUAL RESULTS. PROBABLE ERRORS.

The individual results of the observations are presented in Table III. Under the name of each star are given the approximate coordinates for 1905.0 to the tenth of a minute of time and the tenth of a minute of arc. Then follow, for certain stars, two columns of numbers, one at the left and one at the right, in which are given in full the seconds of time and arc of the observed positions for 1905.0 in right ascension and declination respectively. These are the stars for the determination of whose places the present work was undertaken. The remaining stars are the standard stars, and for these the observed corrections to the ephemeris only are given. The corresponding dates of observation common to the stars are given, in general, in the first column of the left-hand page of each opening; but in a few cases, where the dates change, a new series of dates is inserted where required.

The reductions to mean place were computed with the aid of the tables based upon the constants of the Paris Conference, and the places of the seven standard circumpolar stars, for which the *American Ephemeris* was adopted as authority, were taken from the tables of apparent places based upon those constants.

The numerals I and II placed at the right of the numbers for a given date, indicate the screen through which the star was observed on that date. A numeral enclosed in parenthesis indicates that it was assumed that the corresponding screen was employed; and the mean apparent magnitude in Table IV was computed accordingly. When no numeral is given, the vacant wing of the apparatus was placed in front of the telescope or, in many cases, the screen frame was not brought into position at all for the observation. For a few observations made in July and August, 1907, the slat screen referred to at page 241 was employed and this fact is indicated in the table by the symbol S.

In a few cases numbers are enclosed in brackets [ ], indicating that those numbers were rejected in computing the means.

The probable errors of the single observed positions were computed for all the stars whose positions were to be determined and the following results obtained. The modified PETERS' formula

$$r = \pm\ 0.8453\ \frac{[v]}{\sqrt{m\ (m-n)}},$$

was employed.

General probable error, single observed R. A. from $[v]$,	$\pm\ 0^{s}.0242$, 316 obs'ns on 65 stars
General probable error, single observed R. A. from $[v \cos \delta]$,	$\pm\ 0^{s}.0196$, 316 obs'ns on 65 stars
General probable error, single observed Decl.,	$\pm\ 0''.301$, 318 obs'ns on 65 stars

As regards conditions of observation, the only obvious circumstance that would suggest a classification of the stars in the investigation of the probable errors, is that of the season of the year. It appears that 16 out of the 65 stars were observed during the colder months, from November to February. The probable errors were computed separately for these and for the remaining stars, with the following results:

Nov.-Feb.	Probable error, single observed R. A. from $[v]$,	$\pm\ 0^{s}.0238$, 97 obs'ns on 16 stars
	Probable error, single observed R. A. from $[v \cos \delta]$,	$\pm$ 0.0214, 97 obs'ns on 16 stars
Mar.-Oct.	Probable error, single observed R. A. from $[v]$,	$\pm$ 0.0244, 219 obs'ns on 49 stars
	Probable error, single observed R. A. from $[v \cos \delta]$,	$\pm$ 0.0187, 219 obs'ns on 49 stars
Nov.-Feb.	Probable error, single observed Decl.,	$\pm\ 0.''370$, 96 obs'ns on 16 stars
Mar.-Oct.	Probable error, single observed Decl.,	$\pm$ 0.271, 222 obs'ns on 49 stars

The probable errors of the single observed corrections to the ephemeris in the case of the standard stars were also computed, employing PETER'S formula. Only these stars were included under either coordinate upon which four or more observations were secured in that coordinate. This appeared to result in a fair distribution through the season of the year and also in declination. Standard circumpolars were excluded in right ascension. Of the remaining stars, satisfying the condition of four or more observations and therefore included in the computation, all were of

declination less than 50° excepting four stars which were between 60° and 73°. The results were as follows:

Probable error, single observed $\Delta\alpha$, from $[v \cos\delta]$, $\pm\ 0^{s}.0169$, 355 obs'ns on 71 stars.

Probable error, single observed $\Delta\delta$, $\pm\ 0''.252$, 393 obs'ns on 78 stars.

But, in drawing the curves to represent the equator points derived from the observations of the standard stars where the circle readings were abscissae, the stars near the extremes may have had undue weight. Accordingly a second computation was made of the probable error of $\Delta\delta$, omitting all stars south of $-5°$ and north of 70° in declination, with the following result, which shows no material deviation from the preceding:

Probable error, single observed $\Delta\delta$, $\pm\ 0''.244$, 275 obs'ns on 56 stars.

EXPLANATION OF TABLE IV — OBSERVED POSITIONS, 1905.0.

The mean results of the observations are presented in Table IV.

In the *second* column, Mag.$_1$, are given the catalogue or standard magnitudes of stars. They are taken from the Potsdam and Harvard photometries, for all stars found therein, the former for stars north of the equator, the latter for those south of the equator. There remain certain of the stars whose positions were to be determined, stars which have been observed for binary motion, and for these the estimates of the original observers have been adopted.

In the *third* column is indicated the screen through which the star was observed. If a star was observed at least once through Screen II, that numeral is given, although all the remaining observations of that star may have been made through Screen I or none at all. Similarly with regard to the numeral I for the brighter stars which were not observed through Screen II.

In the *fourth* column, Mag.$_2$, are given the mean apparent magnitudes of the stars for the observations made in the present work. Numerous estimates of magnitude were made by the observer, but not in all cases; and an attempt has been made to present at least an approximate expression by combining these estimates with the standard magnitudes of the third column and the reductions effected by the screens when employed. In some cases the dates of observation in right ascension are not identical throughout with those in declination. and in these cases the value of Mag.$_2$ corresponds to the observations in right ascension alone.

In the *fifth* column of the left hand page and the *first* column of the right hand page are given the mean coordinates for 1905.0 which result from the observations. In the cases of those stars whose positions were to be determined in the present work, these results are the arithmetical means of the individual results given in Table III. These stars are readily distinguished in Table IV by the fact that they are the only stars for which values of the precession, secular variation, and proper motion are given. For the remaining stars, all of which are standard stars, the resulting coordinates are in each case those of the corresponding ephemeris for

1905.0, corrected by the application of the mean of the individual observed corrections of Table III. All stars of the present list whose declinations are over 75° are standard circumpolars. So far as the right ascensions are concerned, these stars were employed only in determining the constant n of Bessel's formula.

The precessions given in the table were derived directly from tbe precessions and secular variations computed by Professor Comstock for 1850. These resulting precessions, for 1905, were then compared with those computed independently for the reductions to mean place in the present work.

The proper motions are those found by Professor Comstock, and are the differences between the centurial variations and the centurial precessions, the former derived from the coordinates determined by early and recent observers. No proper motions whatever were applied in the present work.

In the columns No. of Obs. are indicated the number of observations made in each coordinate in the present series. These numbers are irregular and very small for most of the standard stars, because the policy was adopted, in making up the observing list, of distributing the choice of the ephemeris stars so far as was practicable in order to reduce the effect of errors peculiar to individual stars.

In the last column of the right-hand page is indicated the authority for the adopted positions of the standard stars. This was the *American Ephemeris* in all cases of stars found therein with the exception of a few circumpolar stars for which daily or bi-daily positions were given only in the other ephemerides. In this column N indicates that the authority is the British *Nautical Almanac*, and C that it is the *Connaissance de Temps*; for a few later observations B indicates that it is the *Berliner Jahrbuch* reduced to Newcomb's fundamental catalogue.

The computations of the apparent positions from the data in the observing books were made by my daughter, Miss Helen Flint, student assistant in the observatory. She also did a considerable part of the remaining work. All the observations were made by myself; the computation of the precessions and reductions to mean place, and the compilation and comparison of results, were also done by myself.

No attempt has been made to check the work throughout by duplicate computation or examination of every detail. An inspection of abnormal and larger residuals revealed some cases of error. Constants were checked carefully to avoid systematic errors of computation. Whenever an error was found which might be due to causes other than purely accidental, the entire work was examined for other errors of a similar nature. So far as a computer is intelligent and keeps his attention on his work, the errors of computation which remain after the application of such a system of inspection, will be similar to accidental errors of observation and simply increase to a slight degree the probable errors of the results.

TABLE I.—INSTRUMENTAL CONSTANTS EMPLOYED IN THE DETERMINATION OF RIGHT ASCENSION.

Date	Sid. Hour	b	No. of Determinations	c″	Adopted Clock Rate	n	No. of Determinations	ΔT + m	No. of Clock Stars	Hourly Variation
1903	h	s		s	s	s		m s		s
Oct. 19.3	23.0	— 0.293	3	— 1.086	— 0.025	— 1.050	3	— 14 51.886	17	0.0000
24.3	23.5	.260	1	1.074	.025	0.755	3	54.875	16	.0000
26.3	23.0	.244	6	1.042	.018	.832	3	55.740	19	(— .0317)
27.3	23.5	.259	3	1.047	.018	.820	3	56 160	17	(.0000)
29.3	23.5	.244	3	1.001	.018	0.863	3	56.960	15	— 0.0313
Nov. 2.4	3.5	— 0.320	5	— 1.004	— 0.018	— 1.016	3	— 14 59.575	16	— 0.0100
1904 Jan. 6.3	3.8	+ 0.375	4	— 0.103	.018	— 0.065	3	— 15 29.353	16	.0000
13.2	3.5	+ 0.409	4	— 0.124	.018	— 0.091	3	32.838	19	— .0428
Feb. 24.3	6.5	+ 0.901	3	— 0.186	.018	+ 0.654	2	46.137	7	— .0521
Mch. 3.3	7.3	.991	4	.196	.021	.530	4	49.068	18	— .0194
22.3	10.0	+ 0.934	4	— 0.161	— 0.021	+ 0.078	4	— 15 57.955	24	(— 0.0338)
Apr. 3.3	10.5	.849	7	.129	.021	— .016	4	16 3 987	23	.0000
6.3	10.5	.625	6	.224	.021	.194	4	5.225	23	(— 0.0200)
16.3	11,5	.431	2	.184	.021	.353	3	11.247	9	.0000
21.3	11.5	+ 0.243	5	.179	— 0.021	— 0.463	3	— 16 13.602	12	.0000
May 23.3	13.0	— 0.021	3	— 0.224	+ 0.002	— 0.831	3	+ 0 18.265	10	(— 0.0340)
26.3	13.0	.126	2	.238	+ .002	.844	3	18.275	10	— .0280
June 28.3	15.8	.116	2	.233	— .004	.680	2	17.667	7	— .0000
July 1.3	17.0	.121	5	.226	.010	.672	3	16.765	23	(— .0312)
9.3	17.0	.257	7	.260	.010	.791	4	14.865	21	— .0208
12.3	17.3	— 0.223	4	— 0.249	— 0.010	— 0.740	4	+ 0 13.995	24	(0.0000)
14.3	17.0	.228	6	.241	— .010	.806	4	13.435	24	(— .0205)
Aug. 10.4	20.3	.241	5	.205	+ 0.012	.690	3	+ 0 16.103	12	+ .0167
16.4	20.2	.213	3	.252	.012	.749	4	18.318	12	— .0107
22.4	20.2	.263	3	.195	.012	.770	3	19.824	12	— .0240

TABLE I (Continued).

Date	Sid. Hour	b	No. of Determinations	c″	Adopted Clock Rate	n	No. of Determinations	$\Delta T + m$	No. of Clock Stars	Hourly Variation
1904	h	s		s	s	s		m s		s
Aug. 26.4	20 0	— 0.208	2	— 0.204	+ 0.012	— 0.741	3	+ 0 21.230	12	— 0.0240
Sept. 3.3	20.2	.281	3	.229	.012	.759	3	23.300	11	— .0240
9.3	20.2	.446	4	— 0.219	.012	.936	2	24.985	10	+ .0515
Nov. 11.4	4.0	.737	5	+ 0.560	.012	.950	4	39.514	22	— .0165
15.4	4.0	.620	5	.588	.012	0.990	4	40.705	27	+ .0072
18.4	1.5	— 0.551	2	+ 0.588	+ 0.012	— 1.060	1	+ 0 41.752	5	— 0.0240
1905										
Jan. 3.3	4.0	.563	6	— 1.615	.012	0.841	5	53.942	27	(+ .0240)
13.2	3.0	.299	4	1.605	.020	0.376	3	58.022	13	— .0400
16.2	3.0	— 0.282	4	1.564	.020	— 0.279	3	59.552	16	— .0150
Feb. 22.3	6.2	+ 0.429	2	1.653	.020	+ 0.283	2	+ 1 18.450	9	+ .0070
May 8.4	13.0	— 0.242	4	— 1.666	+ 0.014	— 0.798	3	+ 1 47.033	11	— 0.0280
19.3	12.0	.319	2	1.713	.014	.800	1	50.273	3	— .0280
22.3	13.0	.311	3	1.676	.014	.852	3	1 51.232	12	+ 0.0145
1907										
July 28.4	18.0	— 0.294	2	— 1.705	+ 0.008	— 0.495	1	+ 5 9.940	4	......
29.4	18.0	.284	2	1.675	.008	.534	1	9.969	4	......
Aug. 2.4	18.0	— 0.406	2	— 1.744	+ 0.008	— 0.448	1	+ 5 10.226	4	......
5.4	18.0	.474	2	+ 1.741	.008	.561	1	10.584	4	......
7.4	18.0	— 0.494	2	+ 1.740	+ 0.008	— 0.583	1	+ 5 11.004	4	......

1 Rev. Right Ascension Micrometer = $6^s.2923 \pm 0^s.00045$

NOTES TO TABLE I.

1903. Oct. 24.3. The observed values of $\Delta T + m$ lie in a simple curve extending from 21.8 h. to 1.5 h. with a maximum at 0.2 h. The hourly variations preceding and following the maximum and taken as uniform, are $+ 0^s.0852$ and $- 0^s.0602$ respectively.

1904, Dec. 31, is not included in this table. Owing to clouds and the failure of the pen to mark on the chronograph only three clock stars were secured and a few signals on Polaris remote from the middle and all at one side. Consequently this date was rejected in reducing for right ascensions.

1907. Aug. 5, Aug. 7. Circle West.

TABLE II.—GREATEST AND LEAST VALUES OF THE OBSERVED EQUATOR POINTS FOR EACH DATE OF OBSERVATION.

Date	E_1	E_2		v_1	v_2		v_1'	v_2'	n
	348°40′	348°40′							
	″	″		″	″		″	″	
1903, Oct. 19	24.4	21.2	r	+ 1.4	− 0.9	m			18
24	24.5	22.6	c	0.3	0.5	m			18
26	26.2	24.3	c	0.7	0.9	c	+ 0.7	− 0.6	22
27	25.0	23.0	c	0.5	0.9	r	0.6	0.8	19
29	26.0	24.2	r	1.3	1.0	r	0.7	0.7	21
Nov. 2	24.6	22.4	c	+ 0.7	− 1.0	c	+ 0.5	− 1.2	18
1904, Jan. 6	14.1	10.7	r	1.4	2.0	c	0.6	1.1	16
13	13.1	11.0	c	1.0	0.7	c	0.7	0.8	19
Feb. 24	3.8	2.1	r	0.6	0.9	r	0.7	0.8	8
Mch. 3	4.1	0.8	r	1.0	0.7	m			20
22	7.2	5.4	r	+ 1.0	− 1.0	c	+ 1.1	− 0.9	24
Apr. 3	10.8	8.9	c	0.6	0.6	m			23
6	12.0	10.1	c	0.3	0.5	m			23
16	16.4	14.8	c	0.7	0.5	m			9
21	17.7	16.1	c	0.3	0.5	m			12
May 23	22.8	21.8	m	+ 0.5	− 0.5	m			10
26	23.4	21.3	r	1.3	0.9	c	+ 0.5	− 0.5	10
June 28	18.6	17.5	r	0.5	0.6	r	0.6	0.4	5
July 1	19.6	16.9	c	1.0	1.0	c	0.4	1.2	22
9	17.8	15.8	c	0.7	0.7	m			21
12	18.5	16.3	c	+ 1.0	− 1.2	c	+ 0.5	− 0.6	26
14	19.3	17.0	r	0.8	1.0	m			22
Aug. 10	19.4	18.4	r	0.5	0.6	m			13
16	20.3	18.7	c	0.8	0.9	r	1.0	0.8	14
22	20.2	17.5	r	1.3	1.5	c	0.7	0.9	15

TABLE II (Continued).

Date			E_1	E_2		v_1	v_2		v_1'	v_2'	n
			″	″		″	″		″	″	
1904,	Aug.	26	20.1	18.1	c	+ 0.6	— 1.3	m			16
	Sept.	3	20.9	18.5	c	0.9	1.1	r	+ 0.8	— 1.2	14
		9	20.5	18.6	r	0.8	0.6	m			14
	Nov.	11	21.8	20.0	c	0.6	0.7	c	0.3	0.7	21
		15	22.2	20.0	c	1.2	1.0	c	1.0	1.3	27
		18	22.9	21.8	r	+ 0.1	— 0.3	m			4
	Dec.	31	37.4	35.7	r	0.3	0.6	m			5
1905,	Jan.	3	36.7	34.8	c	0.6	1.0	m			28
		13	32.7	29.9	c	1.1	1.5	c	+ 1.0	— 0.6	15
		16	32.0	29.7	c	0.6	1.9	r	0.6	1.8	16
	Feb.	22	20.0	18.3	r	+ 0.3	— 0.4	m			10
	May	8	39.5	37.3	c	0.9	0.7	c	+ 0.4	— 0.7	12
		19	37.4	36.8	m	0.3	0.3	m			2
		22	37.9	36.5	r	0.7	0.6	r	+ 1.0	— 0.4	13
1907,	July	28	37.9	37.2	m	+ 0.4	— 0.3	m			4
		29	38.4	37.4	m	0.5	0.5	m			4
	Aug.	2	38.4	36.0	m	1.2	1.1	m			4
			262°25′	262°25′							
		5	17.3	16.5	m	+ 0.3	— 0.5	m			4
		7	22.1	21.0	m	+ 0.7	— 0.4	m			4

1 Rev. Declination Micrometer = 94″.348 ± 0″.025

NOTES TO TABLE II.

1904, Feb. 24. Fresh northwest wind; temperature, 11° to 4° F. Hands became very cold. Sky gradually filling with clouds.

1905, Jan. 16. Poor seeing. Next largest negative residual is — 0″.8. Residual — 1″.9 is given by γ' Eridani, $3^h\ 53^m$, — 13° 47′; if the mean observed correction to the ephemeris for this star, + 0″.57, (8 obs.), were applied, this residual would become — 1″.3.

1907, Aug. 5, Aug. 7. Circle West.

TABLE III

Individual Results of Observations

TABLE III. INDIVIDUAL RESULTS

Name of Star	Arg. 559		22 Andromedae		γ Pegasi	
Approx. R. A.	h 0	m 1.7	h 0	m 5.4	h 0	m 8.3
Approx. Decl.	28°	29′.8	45°	32′.6	14°	39′.3
1903, Oct. 19	40.71	50.2	....	...	− 0.04	+ 0.3 (I)
24	74	0.2	....	...	.00	0.0 I
26	74	1.0	− 0.14	+ 0.3	....	...
27	75	0.2	....	...	+ .04	− 0.2 I
29	75	0.4	− 0.10	− 0.1 I	....	...
Mean	40.738	50.40	− 0.120	+ 0.10	0.000	+ 0.05
Name of Star	Σ 42		54 Piscium		o Cassiopeiae	
Approx. R. A.	0	30.9	0	34.4	0	39.4
Approx. Decl.	29	28.8	20	44.3	47	45.6
1903, Oct. 19	58.43	50.4	....	...	− 0.06	− 0.4 I
24	39	49.5	25.16	17.6	− .06	+ 0.2 I
26	43	50.0	16	7.1	....	...
27	45	50.3	15	7.1	− .05	+ 0.2 I
29	45	49.9	23	7.1	....	...
Mean	58.430	50.02	25.175	17.22	− 0.057	0.00
Name of Star	β Andromedae		ϑ Cassiopeiae		ζ′ Piscium	
Approx. R. A.	1	4.4	1	5.3	1	8.8
Approx. Decl.	35	7.0	54	38.7	7	4.4
1903, Oct. 19	....	...	18.62	42.4 I	− 0.03	+ 0.5
24	....	...	73	0.9 I	− .03	− 0.1 I
26	....	...	66	2.4 (I)[1]	− .02	− 0.1
27	....	...	75	2.1 I	....	...
29	....	...	76	1.6 I	....	...

OF OBSERVATIONS.

Σ 23			σ 6			44 Piscium			49 Piscium		
h	m		h	m		h	m		h	m	
0	12.6		0	15.0		0	20.5		0	25.8	
− 0°	12′.6		37°	42′.4		1°	24′.8		15°	30′.8	
36.66	− 35.3		1.96	27.0		− 0.02	+ 1.0		50.89	46.8	
64	4.6		1.96	6.3		....	...		.91	6.1	
64	3.3		1.99	6.7		− .03	− 0.4	I	.96	6.1	
64	4.9		2.00	6.4		....	...		.98	5.9	
68	3.9		2.02	6.6		+ 0.01	− 0.1	I	.95	5.7	
36.652	− 34.40		1.986	26.60		− 0.013	+ 0.17		50.938	46.12	

δ Piscium			γ Cassiopeiae			Σ 80			ε Piscium		
0	43.8		0	51.0		0	54.5		0	58.0	
7	4.1		60	12.1		+ 0	16.1		7	22.7	
+ 0.02	− 0.1	I	− 0.04	+ 0.7	II	31.18	7.9		....	...	
....	...		+ .03	+ 0.4	II	.21	8.5		....	...	
+ .02	− 0.4	I	.00	+ 0.3	II	.22	7.6		+ 0.02	− 0.4	I
....	...		+ .03	+ 0.5	II	.24	7.5		+ .05	− 0.4	I
....	...		+ .07	+ 0.5	II	.21	8.1		− .03	− 0.2	I
+ 0.020	− 0.25		+ 0.018	+ 0.48		31.212	7.92		+ 0.013	− 0.33	

f Piscium			ϑ′ Ceti			Σ 125			α Ursae Minoris		
1	12.9		1	19.3		1	22.1		1	24.7	
3	6.9		− 8	40.4		− 0	38.8		88	48.0	
....	...		+ 0.07	0.0		....	...		+ 0.76	− 1.3	II
+ 0.02	+ 0.3		....	...		....	...		+ 0.03	− 0.2	I
+ .01	+ 0.1	I	....	...		....	...		− 1.47	− 0.2	II
− .05	+ 0.8	I	....	...		....	...		+ 0.85	− 0.3	II[2]
− .04	+ 0.4	I	....	...		....	...		− 0.30	− 0.8	II

TABLE III (Continued).

Name of Star	β Andromedae—Con.			ϑ Cassiopeiae—Con.		ζ′ Piscium—Con.		
1903, Nov. 2	....	...		....	...	+ .01	+ 0.7	I
1904, Jan. 6	+ 0.03	...		....	...	....	...	
13	− .06	+ 0.1		....	...	....	...	
Nov. 11	....	...		....	...	....	...	
15	.00	+ 1.0		....	...	....	...	
18	+ .08	− 0.1	II	....	...	− .01	0.0	
Dec. 31	....	0.0	I	....	...	....	− 0.1	
1905, Jan. 3	+ .02	+ 0.5	II	....	...	.00	+ 0.4	
13	− .05	+ 0.5	I	....	...	.00	+ 0.1	
16	− .02	− 0.3	I	....	...	− .02	− 0.4	
Mean	0.000	+ 0.24		18.704	41.88	− 0.012	+ 0.11	

Name of Star	Σ 132		Σ 142 (s)		107 Piscium		
Approx. R. A.	1^{h}	$26^{m}.9$	1^{h}	$34^{m}.8$	1^{h}	$37^{m}.3$	
Approx. Decl.	16°	27′.8	14°	46′.5	19°	48′.8	
1903, Nov. 2	55.82	48.4	....	...[4]	20.29	25.5	
1904, Jan. 6	.84	7.4	....	...	....	...	
13	.83	7.7	48.86	30.5	.28	4.9	
Nov. 11	.79	7.4	....	...	.25	4.1	I
15	.83	8.2	.85	29.9	.23	4.8	
18	.82	7.6	....	...	....	...	
Dec. 31	....	7.2	....	...	....	...	
1905, Jan. 3	.83	7.7	.89	28.8	....	...	
13	.84	7.6	.91	30.6	.24	5.0	
16	.81	7.4	.82	30.3	.23	...	
Mean	55.823	47.66	48.865	30.02	20.253	24.86	

TABLE III (Continued).

f Piscium—Con.			ϑ′ Ceti—Con.			Σ 125—Con.		α Ursae Minoris—Con.		
— .01	+ 0.6		....	...		7.94	— 28.3	+ 0.14	— 0.3	I
+ .01	0.0		....	...		.92	30.4	+ 0.34	...	
+ .03	— 0.5	I	....	...		.99	29.2	+ 0.12	...	II
+ .02	— 0.2	I	....	...		.99	30.6	— 0.49	...	II
— .03	0.0	I	+ .02	— 0.6	I	....	...	— 0.22	...	II
....	...		....	...		....	...[3]	+ 0.22	...	
....	...		....	— 0.4		....	...	....	...	
....	...		....	...		8.05	29.6	— 0.33	...	II
....	...		+ .02	— 0.4	I	7.95	29.7	— 0.78	...	
....	...		— .01	+ 0.2	I	7.95	29.4	+ 0.69	...	
— 0.004	+ 0.17		+ 0.025	— 0.24		7.970	— 29.61	— 0.031	— 0.52	

o Piscium			ζ Ceti			β Arietis			α Arietis		
h 1	m 40.4		h 1	m 46.8		h 1	m 49.4		h 2	m 1.8	
8°	40′.8		— 10°	48′.2		20°	20′.6		23°	0′.5	
....	...		— 0.04	— 0.5	I[5]	+ 0.03	— 0.3[5]		....	...	
+ 0.02	— 0.1		....	...		+ .05	0.0	I	....	...	
....	...		+ .02	— 0.5	I	+ .04	— 0.1	I	....	...	
— .05	+ 0.1		— .01	...	I	....	...		+ 0.02	+ 0.4	II
....	...		— .01	— 0.8	I	....	...		+ .02	+ 0.2	II
....	...		— .01	0.0		— .03	+ 0.2	I	....	...	
....	+ 0.6	I	....	...		....	— 0.3	I	....	...	
.00	0.0	I	....	...		+ .02	— 0.2		+ .03	— 0.3	II
....	...		.00	0.0	I	....	...		.00	+ 0.1	II
....	...		.00	— 0.6	I	....	...		+ .03	— 0.7	II
— 0.010	+ 0.15		— 0.007	— 0.40		+ 0.022	— 0.12		+ 0.020	— 0.06	

TABLE III (Continued).

Name of Star	γ Trianguli		ξ² Ceti		ϑ Persei	
Approx. R. A.	h 2	m 11.7	h 2	m 23.1	h 2	m 37.7
Approx. Decl.	33°	24′.5	8°	2′.1	48°	49′.6
1903, Nov. 2	− 0.03	− 0.2 I	....	...	− 0.07	− 0.3 I
1904, Jan. 6	− .03	+ 0.3 I	+ 0.02	− 0.3 I	− .08	+ 0.4 I
13	− .02	− 0 3 I	+ .04	+ 0.2 I	− .07	− 0.3 I
Nov. 11	....	...	− .02	− 0.4	− .12	+ 0.1 I
15	− .05	0.0 I	− .06	− 0.4 I	− .05	− 0.2 I
1905, Jan. 3	− .03	− 0.2	− .03	− 0.4 I	....	...
13	....	...	− .02	+ 0.6 I	− .06	− 0.3 I
16	− .01	+ 0.3	+ .01	− 0.2 I	− .09	− 0.1 I
Mean	− 0.028	− 0.02	− 0.009	− 0.13	− 0.077	− 0.10

Name of Star	α Ceti		ζ Arietis		f Tauri	
Approx. R. A.	2	57.3	3	9.4	3	25.6
Approx. Decl.	3	43.0	20	41.6	12	36.7
1903, Nov. 2	+ 0.05	− 0.1 I	....	...	0.00	+ 0.1 I
1904, Jan. 6	....	...	0.00	− 0.2	....	...
13	....	...	+ .02	+ 0.4 I	+ .03	+ 0.3 I
Nov. 11	....	...	− .04	− 0.2 I	....	...
15	....	...	+ .04	− 0.2 I	.00	− 0.7 I
1905, Jan. 3	+ .02	...	− .02	− 0.2 I	....	...
13	+ .07	− 0.2	+ .06	− 0.4	− .03	0.0
16	+ .04	...	+ .02	+ 0 7	....	...
Mean	+ 0.045	− 0.15	+ 0.011	− 0.01	0.000	− 0.08

TABLE III (Continued).

B. D. + 36°,566		16 Persei			47 H. Cephei			ε Arietis		
h	m	h	m		h	m		h	m	
2	43.5	2	44.6		2	53.4		2	53.8	
36°	55′.9	37°	55′.7		79°	2′.6		20°	57′.6	
31.27	51.5[6]	....	...		....	...		....	...	
.21	2.3	....	...		....	...		....	...	
.30	1.9	....	...		....	...		+ 0.01	+ 0.3	I
.17	2.2	....	...		....	...		− .02	− 0.4	I
.18	1.9	....	...		0.00	+ 0.1		....	...	
.16	1.5	....	...		.00	+ 0.1		....	...	
....	...	....	...		− .11	− 0.2		....	...	
....	...	34.91	39.7	I	+ .01	+ 0.3		....	...	
31.215	51.88	34.91	39.7		− 0.025	+ 0.08		− 0.005	− 0.05	
7 Tauri		δ Persei			η Tauri			ζ Persei		
3	28.7	3	36.1		3	41.8		3	48.2	
24	8.6	47	29.1		23	48.7		31	36.1	
48.89	45.7	....	...		0.00	+ 0.4	I	....	...	
.89	5.0	− 0.01	− 0.7	I	....	...		....	...	
.89	5.5	....	...		....	...		0.00	− 0.5	I
.84	6.4	− .06	+ 0.8	I	....	...		....	...	
.87	6.0	....	...		+ .05	0.0	II	....	...	
.83	5.7	....	...		− .02	− 0.6	I	.00	− 0.5	II
.88	6.1	....	...		....	...		+ .02	− 0.4	I
.90	6.5	− .03	− 0.3	I	....	...		.00	+ 0.7	I
48.874	45.86	− 0.033	− 0.07		+ 0.010	− 0.07		+ 0.005	− 0.18	

TABLE III (Continued).

Name of Star	γ' Eridani		39 Tauri		$O\Sigma$ 531	
Approx. R. A.	3 h	53.6 m	3 h	59.7 m	4 h	1.2 m
Approx. Decl.	− 13°	46′.7	21°	45′.2	37°	49′.5
1903, Nov. 2	+ 0.04	− 0.1 I	42.70	10.1	14.22	29.6
1904, Jan. 6	+ .05	+ 0.8 I	[2.16]	10.2^{7}	.24	29.5
13	+ .02	+ 0.8 I	2.62	10.2	.27	30.1
Nov. 11	− .01	+ 0.5 I	.63	10.7	.21	30.7
15	+ .02	0.0 I	.62	10.3	.27	28.9
1905, Jan. 3	− .02	+ 0.1 I	.66	9.8	.28	29.3
13	− .03	+ 0.7 I	....	...	.33	29.1
16	+ .03	+ 1.7 I	.68	11.4	....	...
Mean	+ 0.012	+ 0.56	42.652	10.39	14.260	29.60

Name of Star	τ Tauri		π^1 Orionis		i Tauri	
Approx. R. A.	4	36.5	4	44.7	4	45.8
Approx. Decl.	22	46.5	6	47.8	18	40.7
1903, Nov. 2	− 0.05	− 0.5 I	+ 0.05	− 0.4 I	....	...
1904, Jan. 6	....	...	....	...	− 0.07	+ 0.2 I
13	+ .02	0.0 I	− .02	− 0.9 I	....	...
Nov. 11	− .01	0.0 I	+ .03	− 0.2 I	+ .03	...
15	− .05	− 0.1 I	....	...	....	− 0.1 I
1905, Jan. 3	....	...	....	...	.00	+ 0.7 I
13	....	...	+ .01	− 0.9 I	....	...
16	.00	− 0.1 I	.00	− 0.4 I	....	...
Feb. 22	....	...	....	...	....	...
Mean	− 0.018	− 0.14	+ 0.014	− 0.56	− 0.013	+ 0.27

Table III (Continued).

B.A.C. 1235		φ Tauri		ε Tauri		m Persei	
h 4	m 6.5	h 4	m 14.5	h 4	m 23.1	h 4	m 26.7
85°	18′.3	27°	7′.4	18°	58′.2	42°	51′.7
− 0.30	...	30.51	25.6	....	...	− 0.08	− 0.6
− 0.24	...	.52	5.7	− 0.05	− 0.3 I	....	...
+ 0.02	...	.53	5.6	− .02	− 0.1 I	....	...
+ 0.48	...	.49	6.8	.00	− 0.3 I	...	...
+ 0.29	...	.53	6.4 I	....	...	− .06	+ 0.3
+ 0.44	...	.55	6.6 I	− .02	0.0 I	− .05	+ 0.2
+ 0.69	...	.56	5.7 I	....	...	.00	− 0.7
− 0.27	...	.49	6.7	+ .02	− 0.1 I	....	...
+ 0.139	...	30.522	26.14	− 0.014	− 0.16	− 0.048	− 0.20

ι Aurigae		ζ Aurigae		11 Orionis		13 Orionis	
4	50.8	4	55.8	4	59.0	5	2.3
33	1.0	40	56.2	15	16.3	9	21.2
....	...	....	...	− 0.06	− 0.5	26.03	[25.0][8]
....	...	....	...	− .03	− 0.1 I	5.93	23.2
− 0.01	− 0.5 I	....	...	....	...	5.93	2.2
....	...	− 0.04	− 0.2 I	....	...	5.91	2.6
....	...	− .04	− 1.1 I	....	...	5.97	2.7
− .02	+ 0.1 I	....	...	− .02	+ 0.6 I	5.98	1.8
....	...	....	...	....	...	....	...
....	...	....	...	....	...	....	...
....	...	....	...	....	...	....	...
− 0.015	− 0.20	− 0.040	− 0.65	− 0.037	0.00	25.958	22.50

TABLE III (Continued).

Name of Star	τ Orionis			γ Orionis			χ Aurigae		
Approx. R. A.	h 5	m 13.0		h 5	m 20.0		h 5	m 26.6	
Approx. Decl.	− 6°	56′.8		6°	15′.8		32°	7′.3	
1903, Nov. 2	+ 0.05	+ 0.7	I	+ 0.04	− 0.2	II	....	...	
1904, Jan. 6	+ .02	− 0.5		....	...		....	...	
13	.00	− 0.4	I	....	...		− 0.01	+ 0.4	(I)
Feb. 24	....	...		....	− 0.1	I	....	...	
Mch. 3	....	...		....	...		....	...	
Nov. 11	....	...		+ .02	− 0.2		....	...	
15	− .04	+ 0.3	I	.00	...	II[9]	....	...	
1905, Jan. 3	....	...		+ .06	− 0.1	II	.00	+ 0.2	I
Feb. 22	.00	+ 0.3	I	....	...		....	...	
Mean	+ 0.006	+ 0.08		+ 0.030	− 0.15		− 0.005	+ 0.30	

Name of Star	ϑ Aurigae			Name of Star	1 Geminorum		
Approx. R. A.	5	53.2		Approx. R. A	5	58.3	
Approx. Decl.	37	12.4		Approx. Decl.	23	16.1	
1903, Nov. 2	....	...		1904, Feb. 24	− 0.02	− 0.5	
1904, Jan. 6	0.00	+ 0.4	I	Mch. 3	+ .04	+ 0.1	I
13	....	...		Nov. 11	+ .05	+ 0.2	I
Feb. 24	....	...		15	....	...	
Mch. 3	....	...		1905, Jan. 3	....	...	
Nov. 11	....	...		Feb. 22	....	...	
15	.00	− 0.2	II				
1905, Jan. 3	− .01	0.0	II				
Feb. 22	.00	+ 0.4	II				
Mean	− 0.002	+ 0.15		Mean	+ 0.023	− 0.07	

TABLE III (Continued).

ϑ' Orionis			Groom. 944			κ Orionis			South 503		
h	m		h	m		h	m		h	m	
5	30.7		5	31.5		5	43.2		5	50.6	
− 5°	28′.7		85°	9′.0		− 9°	42′.2		13°	55′.3	
....	...		+ 0.34	− 0.1		....	...		....	...	
....	...		+ 0.08	+ 0.9		+ 0.09	− 0.3	II	....	...	
....	...		+ 0.22	...		+ .02	+ 0.3	II	....	...	
....	...		+ 0.06	+ 0.5		+ .08	+ 0.7	I	37.56	20.9	
....	...		+ 0.26	...		+ .03	+ 0.7	II	.60	20.6	
42.92	− 41.2 [10]		+ 0.27	...		− .03	0.0	II	.55	20.7	
2.97	2.9	I	+ 0.20	...		− .02	− 0.1	II	.54	19.2	
2.96	0.6	I	+ 0.14	...		+ .04	− 0.7	II	.58	19.9	
3.01	0.5		+ 0.22	...		+ .01	+ 0.3	II	....	...	
42.965	− 41.30		+ 0.199	+ 0.43		+ 0.028	+ 0.11		37.566	20.26	

ν Orionis			η Geminorum			μ Geminorum			15 Geminorum		
6	2.2		6	9.2		6	17.2		6	22.0	
14	46.8		22	32.1		22	33.8		20	50.7	
0.00	− 0.7		....	...		+ 0.01	− 0.7	I	6.84	52.8	
− .02	− 0.3	I	....	...		− .01	0.0		.88	3.0	
....	...		− 0.03	+ 0.2	I	....	...		.85	3.0	
− .03	0.0	I	.00	0.0	I	....	...		.88	1.6 [11]	
....	...		− .03	− 0.3	I	....	...		.79	3.1	
− .02	− 0.2	I	....	...		.00	− 0.2	I	.86	2.5	
− 0.020	− 0.28		− 0.020	− 0.03		0.000	− 0.30		6.850	52.67	

TABLE III (Continued).

Name of Star	γ Geminorum			O Σ 154		ϑ Geminorum		
Approx. R. A.	h 6	m 32.2		h 6	m 37.6	h 6	m 46.5	
Approx. Decl.	16°	28′.8		40°	43′.3	34°	4′.6	
1904, Feb. 24	....	...		38.34	15.9	+ 0.04	− 0.1	I
Mch. 3	0.00	+ 0.1	II	.27	5.9	− .03	− 0.6	
Nov. 11	− .04	+ 0.3	II	.28	...	+ .01	− 0.1	I
15	+ .07	+ 0.6	II	.37	4.9	+ .06	+ 0.1	I
1905, Jan. 3	+ .02	+ 0.9	II	.22	6.5	+ .02	− 0.4	
Feb. 22	+ .02	− 0.1	II	.28	5.5	− .02	− 0.1	I
Mean	+ 0.014	+ 0.36		38.293	15.74	+ 0.013	− 0.20	

Name of Star	β Canis Minoris			Name of Star	26 Lyncis	
Approx. R. A.	7	21.9		Approx. R. A.	7	47.8
Approx. Decl.	8	29.0		Approx. Decl.	47	48.7
1904, Feb. 24	....	...		1904, Mch. 3	....	...
Mch. 3	....	...		22	....	...
22	....	...		Apr. 3	− 0.11	− 0.2
Nov. 11	....	...		6	− .04	+ 0.2
15	− 0.02	...	I			
1905, Jan. 3	− .01	+ 0.6	I			
Feb. 22	.00	+ 0.3	II			
Mean	− 0.010	+ 0.45		Mean	− 0.075	0.00

TABLE III (Continued).

Name of Star	ϑ Canis Majoris		51 H. Cephei		51 Geminorum	
Approx. R. A.	h 6	m 49.8	h 6	m 56.2	h 7	m 7.2
Approx. Decl.	− 11°	55′.2	87°	11′.9	16°	19′.2
1904, Feb. 24	0.00	... I	0.00	...	− 0.04	+ 0.2
Mch. 3	+ .04	0.0 I	− 1.18	...	....	+ 0.1 I
22	+ .04	+ 0.1 I	+ 0.34	+ 0.1	− .02	0.0
Nov. 11	− .05	... I	+ 0.52	− 0.2	− .06	− 0.2 I
15	+ .06	+ 0.1 I	+ 0.07	− 0.3	− .04	+ 0.5 I
1905, Jan. 3	+ .03	0.0	− 0.36	− 0.3	− .03	− 0.6 I
Feb. 22	+ .01	− 0.2 I	− 0.33	...	....	− 0.4 I
	+ 0.019	0.00	− 0.134	− 0.18	− 0.038	− 0.04

ω′ Cancri		B.A.C. 2320		P. vii, 321		β Cancri	
7	55.2	8	3.4	8	5.7	8	11.4
25	39.2	88	55.2	32	45.4	9	28.7
0.00	+ 0.1	+ 0.54	...	41.53	21.9	....	...
+ .05	− 0.2	− 0.50	...	.47	1.8	....	...
+ .01	− 0.5	+ 2.30	...	.45	2.0	+ 0.04	+ 0.2
− .02	− 0.3	+ 0.01	...	.48	1.6	+ .03	− 0.5 I
+ 0.010	− 0.22	+ 0.588	...	41.482	21.82	+ 0.035	− 0.15

TABLE III (Continued).

Name of Star	σ 294		30 Monocerotis		η Cancri	
Approx. R. A.	h 8	m 18.3	h 8	m 20.9	h 8	m 27.2
Approx. Decl.	42°	18′.7	— 3°	35′.8	20°	45′.8
1904, Mch. 3	16.99	40.3	0.00	+ 0.7	....	...
22	7.00	0.3	+ .01	...	— 0.01	+ 0.4
Apr. 3	6.96	0.0	....	...	.00	+ 0.4 I
6	7.01	0.0	— .02	+ 0.2 I	+ .02	— 0.4 I
Mean	16.990	40.15	— 0.003	+ 0.45	+ 0.003	+ 0.13
Name of Star	75 Cancri		π Cancri		σ 331	
Approx. R. A.	9	3.2	9	7.1	9	9.7
Approx. Decl.	27	1.4	15	22.7	23	46.4
1904, Mch. 3	12.15	21.4	5.78	45.0	41.32	24.2
22	.15	2.0	.77	4.9	.36	5.0
Apr. 3	.13	1.5	.72	5.1	.34	4.6
6	.15	1.7	.77	4.8	.35	4.7
Mean	12.145	21.65	5.760	44.95	41.342	24.62
Name of Star	ε Leonis		μ Leonis		19 Leonis Minoris	
Approx. R. A.	9	40.5	9	47.4	9	51.9
Approx. Decl.	24	12.7	26	27.3	41	30.5
1904, Mch. 3	....	...	+ 0.02	— 0.1	0.00	0.0 I
22	+ 0.04	0.0 I	....	...	— .03	— 0.5
Apr. 3	....	...	+ .02	+ 0.3 I	— .01	0.0 I
6	— .02	+ 0.4 I	+ .02	+ 0.5 I	— .02	— 0.3 I
16	....	...	....	...	....	...
21	....	...	....	...	....	...
Mean	+ 0.010	+ 0.20	+ 0.020	+ 0.23	— 0.015	— 0.20

TABLE III (Continued).

σ Hydrae		Σ 1263 (*prec.*)		σ² Cancri		ι Ursae Majoris	
h	m	h	m	h	m	h	m
8	33.8	8	38.9	8	48.4	8	52.7
3°	40′.5	42°	1′.9	30°	56′.4	48°	24′.9
0.00	− 0.4 I	54.38	57.5	+ 0.02	+ 0.1	− 0.04	0.0
+ .02	− 0.4 I	.38	8.1	− .02	− 0.3	− .05	+ 0.4
− .05	0.0 I	.41	7.5	− .01	+ 0.4 I	+ .03	+ 0.4 I
....	...	.38	7.4	+ .02	+ 0.1 I	− .02	− 0.3 I
− 0.010	− 0.27	54.388	57.62	+ 0.002	+ 0.08	− 0.020	+ 0.12
α Lyncis		Name of Star		41 Lyncis		ο Leonis	
9	15.3	Approx. R. A.		9	22.4	9	36.1
34	47.7	Approx. Decl.		46	1.1	10	19.5
+ 0.02	− 0.2	1904, Mch.	3	26.62	5.6	+ 0.02	− 0.2
.00	+ 0.3		22	.53	6.0	+ .01	− 0.3 I[12]
− .01	0.0 I	Apr.	3	.57	5.9	− .01	− 0.7 I
.00	0.0 I		6	.61	5.6	....	...
+ 0.002	+ 0.02	Mean		26.582	5.78	− 0.007	− 0.40
π Leonis		γ′ Leonis		B.A.C. 3495		σ 362	
9	55.2	10	14.7	10	15.9	10	18.3
8	30.0	20	19 3	84	44.1	6	10.6
+ 0.02	− 1.1	....	...	+ 0.57	0.0	18.59	34.6
+ .01	− 0.4	+ 0.04	− 0.8 I	− .24	...	....	...
+ .04	− 0.4	....	...	− .24	...	.65	5.1
.00	− 0.2	....	...	+ .22	...	.65	4.6
+ .03	− 0.8	....	...	− .09	− 0.1	.64	4.4
+ .07	− 0.3	....	...	− .18	...	.67	4.6
+ 0.028	− 0.53	+ 0.04	− 0.8	+ 0.007	− 0.05	18.640	34.66

Table III (Continued).

Name of Star	ρ Leonis		41 Leonis Minoris		Σ 1472	
	h	m	h	m	h	m
Approx. R. A.	10	27.8	10	38.2	10	41.9
Approx. Decl.	9°	47′.7	23°	41′.5	13°	31′.9
1904, Mch. 3	− 0.02	+ 0.5 I	....	...	....	...
22	− .01	− 0.6 I	....	...	58.62	55.0
Apr. 3	.00	+ 0.1 I	....	...	.68	4.6
6	+ .02	0.0 I	....	...	.66	5.2
16	+ .03	...	− 0.03	0.0 I	.70	5.1
21	+ .01	− 0.3 I	− .01	− 0.1 (I)	.61	4.3
Mean	+ 0.005	− 0.06	− 0.020	− 0.05	58.654	54.84
Name of Star	σ 377		Σ 1517		Σ 1516 (*prec.*)	
Approx. R. A.	11	5.6	11	8.7	11	8.9
Approx. Decl.	66	32.7	20	39.1	73	59.4
1904, Mch. 3	....	...	....	...	....	...
22	35.81	44.7	....	...	....	...
Apr. 3	.77	4.6	....	...	58.84	22.3
6	.81	5.1	41.65	55.8	....	...
16	.87	5.6	41.72	56 0	....	...
21	.99	5.0	....	...	59.33	22.4
Mean	35.850	45.00	41.685	55.90	59.085	22.35
Name of Star	62 Ursae Majoris		χ Ursae Majoris		β Leonis	
Approx. R. A.	11	36.6	11	41.0	11	44.2
Approx. Decl.	32	16.3	48	18.7	15	6.5
1904, Mch. 3	....	...	....	...	....	...
22	37.66	19.1	....	...	− 0.02	− 0.5 II

TABLE III (Continued).

l Leonis		Groom. 1706		β Ursae Majoris		Ursae Majoris	
h 10	m 44.2	h 10	m 52.3	h 10	m 56.1	h 10	m 57.8
11°	3′.2	78°	17′.1	56°	53′.5	62°	16′.2
....	...	....	...	....	...	....	...
− 0.03	+ 0.8	0.00	− 0.1	....	...	+ 0.02	+ 0.4 1
− .06	+ 0.6 I	.00	+ 0.3	....	...	+ .04	− 0.1 II
− .02	− 0.6	+ .04	...	+ 0.04	+ 0.2 I	....	...
....	...	+ .08	...	....	...	....	...
− .05	+ 0.3	+ .06	...	+ .07	+ 0.5 II	....	...
− 0.040	+ 0.28	+ 0.036	+ 0.10	+ 0.055	+ 0.35	+ 0.030	+ 0.15

ν Ursae Majoris		τ Leonis		λ Draconis		υ Leonis	
11	13.3	11	23.0	11	25.7	11	32.0
33	37.1	3	23.1	69	51.7	− 0	17.6
....	...	....	...	....	...	....	...
− 0.02	− 0.2 I	....	...	0.00	− 0.4 I	....	+ 0.2 I
....	...	+ 0.01	+ 0.3 I	....	...	0.00	− 0.4 I
− .07	+ 0.2 I	....	...	− .06	+ 0.4 I	− .02	+ 0.5 I
....	...	+ .04	+ 0.1 (I)	− .05	+ 0.1	....	...
....	...	....	...	+ .06	− 0.2 I	− .01	− 0.5 I
− 0.045	0.00	+ 0.025	+ 0.20	− 0.012	− 0.02	− 0.010	− 0.05

β Virginis		Name of Star	γ Ursae Majoris		π Virginis	
11	45.8	Approx. R. A.	11	48.8	11	55.9
2	18.0	Approx. Decl.	54	13.7	7	8.6
....	...	1904, Mch. 22	....	...	0.00	+ 0.2 I
....	...	Apr. 3	....	...	....	...

TABLE III (Continued).

Name of Star	62 Ursae Majoris—Con.		χ Ursae Majoris—Con.			β Leonis—Con.		
1904, Apr. 3	.69	9.2	− 0.06	− 0.1	I	....	...	
6	.65	9.2	....	...		− .01	+ 0.3	II
16	.73	9.5	− .01	− 0.1		....	...	
21	.70	9.0	− .04	− 0.4		....	...	
Mean	37.686	19.20	− 0.037	− 0.20		− 0.015	− 0.10	

Name of Star	o Virginis			Σ 1607		2 Canum Venat.	
Approx. R. A.	h 12	m 0.4		h 12	m 6.7	h 12	m 11.4
Approx. Decl.	9°	15′.6		36°	37′.1	41°	11′.3
1904, Mch. 22	....	...		45.71	3.4	− 0.18	− 0.1
Apr. 3	− 0.01	+ 0.3	I	.68	3.5	....	...
6	....	...		.67	3.1	....	...
16	....	...		.75	3.5	....	...
21	....	...		.74	3.7	− .14	− 0.2
May 23	+ 0.04	+ 0.5	I	....	...	....	...
26	+ .03	+ 0.2	I	....	...	....	...
1905, May 8	− .01	+ 0.1	I	.69	3.1	....	...
19	+ .04	...	I	.72	3.9	− .10	...
22	+ .01	+ 0.1		.74	3.0	....	...
Mean	+ 0.017	+ 0.24		45.712	3.40	− 0.140	− 0.15

TABLE III (Continued).

β Virginis—Con.		Name of Star	γ Ursae Majoris—Con.		π Virginis—Con.	
+ 0.03	− 0.4 I	1904, Apr. 6	+ 0.02	+ 0.2 II	+ .02	− 0.7 I
....	...	16	− .03	+ 0.2 I	....	...
....	...	21	....	...	....	...
+ .03	+ 0.2 I	May 23	....	...	....	...
		26	....	...	....	...
		1905, May 8	....	...	....	...
		19	....	...	+ .05	... I
		22	....	...	+ .01	− 1.1 I
+ 0.030	− 0.10	Mean	− 0.005	+ 0.20	+ 0.020	− 0.53

6 Ursae Minoris		η Virginis		Name of Star	δ^2 Corvi	
h 12	m 14.4	h 12	m 15.1	Approx. R. A.	h 12	m 25.0
88°	13°.6	− 0°	8′.3	Approx. Decl.	− 15°	59′.2
− 0.12	...	....	...	1904, Apr. 3	+ 0.04	+ 0.4 I [18]
− .58	...	+ 0.03	...	6	+ .02	0.0 I
− .46	...	....	...	16	+ .04	+ 0.4 I
+ .20	...	....	...	21	+ .02	+ 0.1 I
− .16	...	....	...	May 23	....	...
+ 0.58	...	.00	+ 0.4 I	26	....	...
− .11	...	+ .02	− 0.2 I	1905, May 8	+ .02	− 0.1 I
− .10	...	− .03	0.0 I	22	− .01	0.0 I
+ .04	...	....	...			
+ .45	− 0.4	....	...			
− 0.026	− 0.4	+ 0.005	+ 0.07	Mean	+ 0.022	+ 0.13

Table III (Continued).

Name of Star	β Canum Venat.		Σ 1658		ρ Virginis	
Approx. R. A.	h 12	m 29.2	h 12	m 30.3	h 12	m 37.1
Approx. Decl.	41°	52′.7	7°	58′.1	10°	45′.5
1904, Apr. 3	− 0.12	0.0 I	....	...	....	...
6	− .04	+ 0.2 I	....	...	....	...
16	− .08	0.0	....	...	....	...
21	− .08	+ 0.1	....	...[4]	....	...
May 23	....	...	17.43	5.7	− 0.01	+ 0.2
26	....	...	[16.67]	6.7[14]	− .02	+ 0.5 I
1905, May 8	....	...	17.51	6.2	....	...
22	....	...	.48	5.8	.00	+ 0.2 I
Mean	− 0.080	+ 0.08	17.473	6.10	− 0.010	+ 0.30

Name of Star	ε Virginis		ϑ Virginis		σ 434	
Approx. R. A.	12	57.4	13	5.0	13	9.9
Approx. Decl.	11	28.5	− 5	1.9	− 10	51.5
1904, May 23	− 0.02	− 0.3 I	+ 0.02	− 0.2 (I)	57.35	− 29.8
26	+ .02	+ 0.1	.00	+ 0.5 I	.36	29.8
1905, May 8	− .01	− 0.3 I	+ .04	+ 0.8 I	.31	30.5
22	.00	− 0.4 I	+ .01	− 0.3 I	.33	30.9
Mean	− 0.002	− 0.22	+ 0.018	+ 0.20	57.338	− 30.25

Name of Star	η Ursae Majoris		η Bootis		τ Virginis	
Approx. R. A.	13	43.8	13	50.2	13	56.8
Approx. Decl.	49	47.2	18	52.4	2	0.2
1904, May 23	....	...	− 0.02	− 0.5	....	...
26	....	...	....	...	− 0.02	+ 0.5 I
1905, May 8	− 0.03	+ 0.3	+ .01	+ 0.3	....	...
22	+ .03	+ 0.2 I	+ .01	− 0.6 I	.00	+ 0.5 I
Mean	0.000	+ 0.25	0.000	− 0.27	− 0.010	+ 0.50

TABLE III (Continued).

Σ 1678			33 Virginis			32² Camelop.		
h 12	m 40.7		h 12	m 41.5		h 12	m 48.4	
14°	53′.6		10°	4′.2		83°	55′.8	
....	...		....	...		....	...	
....	...		....	...		....	...	
....	...		....	...		....	...	
....	...		....	...		....	...	
40.71	35.8		32.93	15.0		− 0.11	...	
.70	6.0		.97	6.0		+ 0.02	...	
.72	6.0		.95	4.5		+ 0.18	...	
.65	5.1		.93	4.2		− 0.05	...	
40.695	35.72		32.945	14.92		+ 0.010	...	

α Virginis			ζ Virginis			m Virginis			τ Bootis		
13	20.2		13	29.8		13	36.6		13	42.8	
− 10	39.9		− 0	6.6		− 8	13.4		17	55.8	
0.00	0.0	II	....	...		+ 0.04	− 0.3	I	....	...	
.00	+ 0.4	II	+ 0.02	− 0.4	I	....	...		0.00	+ 0.6	I
+ .02	− 0.5	II	− .03	+ 0.4	I	....	...		....	...	
− .03	− 0.3	II	....	...		+ .02	+ 0.3		....	...	
− 0.002	− 0.10		− 0.005	0.00		+ 0.030	0.00		0.00	+ 0.6	

94 Virginis			4 Ursae Minoris			λ Virginis		
14	1.3		14	9.2		14	14.0	
− 8	26.3		77	59.6		− 12	56.0	
− 0.03	+ 0.1		− 0.02	...	I	0.00	0.0	
....	...		+ .06	...		+ .04	− 0.2	I
− .01	− 0.2		− .07	− 0.5		.00	+ 0.3	
....	...		− .02	...		+ .01	− 0.3	
− 0.020	− 0.05		− 0.012	− 0.5		+ 0.012	− 0.05	

TABLE III (Continued).

Name of Star	B.A.C. 5140		β Librae			μ^1 Bootis		
	h	m	h	m		h	m	
Approx. R. A.	15	7.6	15	11.9		15	20.9	
Approx. Decl.	87°	35′.9	− 9°	2′.0		37°	42′.6	
1904, June 28	+ 0.06	...	+ 0.06	...	I	− 0.06	− 0.2	I
July 1	− .61	...	+ .03	− 0.1	I	− .06	+ 0.4	I
9	− .32	...	.00	+ 0.7	I	− .03	+ 0.5	
12	....	...	+ .04	− 0.6	I	+ .01	+ 0.1	I
14	....	...	+ .02	− 0.3	I	− .02	...	
Mean	− 0.290	...	+ 0.030	− 0.08		− 0.032	+ 0.20	
Name of Star	ζ Ursae Minoris		39 Serpentis			Σ 1993, *prec.*		
Approx. R. A.	15	47.4	15	48.8		15	55.5	
Approx. Decl.	78	5.2	13	29.6		17	38.7	
1904, June 28	....	...	46.58	37.1		29.38	43.4	
July 1	....	...	.58	7.5		.39	3.1	
9	....	...	.55	7.1		.34	4.4	
12	0.00	...	.60	7.5		.31	3.8	
14	+ .04	...	.57	6.6		.34	3.3	
Mean	+ 0.020	...	46.576	37.16		29.352	43.58	
Name of Star	σ² Coronae Borealis		τ Herculis			γ Herculis		
Approx. R. A.	16	11.1	16	16.9		16	17.7	
Approx. Decl.	34	6.0	36	32.4		19	22.6	
1904, June 28	....	...	....	...		+ 0.02	+ 0.4	I
July 1	....	...	− 0.07	+ 1.0	I	....	...	
9	+ 0.03	− 0.3	....	...		+ .01	− 0.4	I
12	+ .04	− 0.2	....	...		+ .02	+ 0.3	I
14	....	...	− .06	+ 0.3	I	....	...	
Mean	+ 0.035	− 0.25	− 0.065	+ 0.65		+ 0.017	+ 0.10	

TABLE III (Continued).

β Coronae Borealis			α Coronae Borealis			α Serpentis			μ Serpentis		
h	m		h	m		h	m		h	m	
15	23.9		15	30.7		15	39.6		15	44.6	
29°	26′.0		27°	2′.0		6°	43′.4		− 3°	8′.2	
....	...		− 0.03	0.0	I	+ 0.02	− 0.4	I	....	...	
....	...		....	...		+ .04	+ 0.1	I	....	...	
....	...		.00	+ 0.3	II	+ .04	− 0.3	I	....	...	
− 0.02	+ 0.4	I	+ .01	+ 0.1	II	.00	− 0.3	I	+ 0.01	+ 0.5	I
− .02	− 0.1	I	+ .02	− 0.1	II	....	...		− .02	− 0.2	I
− 0.020	+ 0.15		0.000	+ 0.08		+ 0.025	− 0.22		− 0.005	+ 0.15	
σ 502			ρ Coronae			φ Herculis			δ Ophiuchi		
15	57.1		15	57.4		16	5.8		16	9.4	
26	26.3		33	35.4		45	11.0		− 3	27.0	
6.55	15.2		....	...		− 0.05	+ 0.2	I	....	...	
.64	5.9		....	...		− .07	+ 0.1	I	+ 0.02	+ 0.1	I
....	...		24.67	23.7		− .06	− 0.2	I	....	...	
.56	6.0		....	...		− .06	+ 0.4	I	....	...	
....	...		.65	23.2		....	...		− .01	− 0.8	
6.583	15.70		24.660	23.45		− 0.060	+ 0.12		+ 0.005	− 0.35	
O Σ 311			λ Ophiuchi			β Herculis			ζ Ophiuchi		
16	23.6		16	26.1		16	26.1		16	31.9	
21	6.6		2	11.5		21	41.8		− 10	22.5	
....	...		+ 0.05	...		....	...		....	...	
38.99	35.5		....	...		+ 0.04	− 0.3	I	....	...	
9.00	5.3		+ .02	− 0.1		....	...		0.00	− 0.1	II
8.98	6.0		+ .02	− 0.2		....	...		.00	− 0.1	II
8.97	5.9		....	...		+ .03	− 0.1	I	− .02	+ 0.6	I
38.985	35.68		+ 0.030	− 0.15		+ 0.035	− 0.20		− 0.007	+ 0.13	

TABLE III (Continued).

Name of Star	ζ Herculis		η Herculis		κ Ophiuchi	
	h	m	h	m	h	m
Approx. R. A.	16	37.7	16	39.6	16	53.2
Approx. Decl.	31°	46′.5	39°	6′.2	9°	31′.3
1904, June 28	....	...	....	...	....	...
July 1	− 0.02	+ 0.4 I	....	...	0.00	+ 0.3 I
9	....	...	− 0.02	+ 0.2 I	....	...
12	− .04	0.0 I	....	...	.00	+ 0.5 I
14	....	...	.00	+ 0.2 I	....	...
Mean	− 0.030	+ 0.20	− 0.010	+ 0.20	0.000	+ 0.40

Name of Star	δ Herculis		π Herculis		σ Ophiuchi	
Approx. R. A.	17	11.1	17	11.7	17	21.8
Approx. Decl.	24	57.1	36	55.0	4	13.4
1904, June 28	....	...	....	...	....	...
July 1	....	...	....	...	− 0.04	− 0.1 I
9	0.00	− 0.5 I	....	...	....	...
12	.00	− 0.1 I	....	...	....	...
14	....	...	− 0.02	+ 0.2 I	....	...
1907, July 28	....	...	....	...	....	...
29	....	...	....	...	....	...
Aug. 2	....	...	....	...	....	...
5	....	...	....	...	....	...
7	....	...	....	...	....	...
Mean	0.000	− 0.30	− 0.02	+ 0.2	− 0.04	− 0.1

Table III (Continued).

ε Ursae Minoris			Σ 2120			η Ophiuchi			ζ Draconis		
h 16	m 55.7		h 17	m 0.9		h 17	m 4.9		h 17	m 8.5	
82°	11′.7		28°	13′.3		− 15°	36′.5		65°	49′.9	
....	...		....	...		....	...		....	...	
+ 0.10	...	I	50.60	16.5	I	+ 0.04	− 0.3	I	− 0.02	− 0.4	I
+ .04	...	I	.65	6.6		+ .05	− 0.4		....	...	
+ .14	...		.63	6.3		+ .04	0.0		....	...	
+ .36	...	I	.60	6.1		.00	+ 1.0	I	....	...	
+ 0.160	...		59.620	16.38		+ 0.032	+ 0.08		− 0.02	− 0.4	

β Draconis			α Ophiuchi			ω Draconis			β Ophiuchi		
17	28.3		17	30.5		17	37.5		17	38.8	
52	22.3		12	37.7		68	48.1		4	36.4	
....	...		....	...		....	...		....	...	
+ 0.04	− 0.3	I	....	...		− 0.04	− 0.5	I	....	...	
....	...		+ 0.01	+ 0.3	II	− .03	+ 0.2	I	....	...	
....	...		+ .02	+ 0.4	II	− .08	0.0	I	....	...	
....	...		.00	− 0.4	II	+ .04	+ 0.5	I	....	...	
....	...		+ .01	+ 0.4	S	....	...		....	...	
....	...		....	...		....	...		− 0.01	+ 1.2	
....	...		....	...		....	...		....	...	
....	...		....	...		....	...		....	...	
....	...		+ .01	+ 0.7	S[18]	....	...		....	...	
+ 0.04	− 0.3		+ 0.010	+ 0.28		− 0.028	+ 0.05		− 0.01	+ 1.2	

TABLE III (Continued).

Name of Star	μ Herculis		γ Ophiuchi		ν Ophiuchi	
Approx. R. A.	h 17	m 42.7	h 17	m 43.1	h 17	m 53.8
Approx. Decl.	27°	46′.6	2°	44′.6	− 9°	45′.7
1904, June 28	....	...	....	...	....	...
July 1	....	...	....	...	0.00	...
9	....	...	....	...	− .02	+ 0.1 I
12	....	...	....	...	− .04	+ 0.3 I
14	0.00	+ 0.1 I	....	...	....	...
1907, July 28	....	...	− 0.04	− 0.1	....	...
29	− .05	+ 0.5	....	...	− .01	0.0
Aug. 2	....	...	− .03	+ 0.3	....	...
5	.00	+ 0.3[18]	....	...	+ .01	0.0[18]
7	....	...	+ .01	− 0.2	....	...
Mean	− 0.017	+ 0.30	− 0.020	0.00[19]	− 0.012	+ 0.10

Name of Star	36 Draconis		η Serpentis		109 Herculis	
Approx. R. A.	18	13.8	18	16.4	18	19.6
Approx. Decl.	64	43.2	− 2	55.4	21	43.6
1904, June 28	....	...	....	...	....	...
July 1	48.91	9.5	....	...	....	...
9	.79	10.5	+ 0.05	− 0.6	....	...
12	.73	9.9	....	...	....	...
14	.81	10.0	....	...	....	...
1907, July 28	....	...	+ .05	− 0.3	....	...
29	....	...	+ .06	− 0.5	....	...
Aug. 2	....	...	....	...	+ 0.02	− 1.1
5	....	...	+ .01	− 0.5[18]	....	...
7	....	...	+ .02	− 0.4[18]	....	...
Mean	48.810	9.98	+ 0.038	− 0.46	+ 0.02	− 1.1[19]

Table III (Continued).

γ Draconis			70 (a) Ophiuchi		δ Ursae Minoris			μ Sagittae		
h	m		h	m	h	m		h	m	
17	54.4		18	0.7	18	2.9		18	8.1	
51°	30′.0		2°	31′.3	56°	36′.8		— 21°	5′.0	
....	...		....	...	....	...		....	...	
....	...		....	...	+ 0.14	...		+ 0.04	0.0	
....	...		....	...	+ .10	...	I	....	...	
....	...		....	...	— .11	— 0.7	I	....	...	
— 0.01	— 0.3	II	....	...	— .40	— 0.6		+ .04	— 0.1	
....	...		+ 0.05	+ 1.7	....	...		....	...	
....	...		+ .07	+ 1.4	....	...		....	...	
....	...		+ .06	+ 1.0	....	...		+ .01	— 0.4	
....	...		+ .06	+ 1.9 [18]	....	...		....	...	
....	...		+ .06	+ 1.8 [18]	....	...		....	...	
— 0.01	— 0.3		+ 0.060	+ 1.61 [20]	— 0.068	— 0.65		+ 0.030	— 0.17	
χ Draconis			29 Scuti		1 Aquilae			α Lyrae		
18	22.8		18	26.2	18	30.0		18	33.7	
72	41.5		— 10	51.7	— 8	18.7		38	41.7	
....	...		....	...	....	...		....	...	
— 0.06	— 0.3	I	9.52	— 42.1	+ 0.06	+ 0.1		....	...	
— .12	+ 0.5	I	.57	1.9	+ .01	+ 0.1		....	...	
— .11	0.0	I	.53	2.1	....	...		....	...	
— .08	...	I	.57	1.9	....	...		— 0.03	— 0.3	II
....	...		....	...	....	...		....	...	
....	...		....	...	+ .01	0.0		....	...	
....	...		....	...	....	...		....	...	
....	...		....	...	— .02	+ 0.2		....	...	
....	...		....	...	....	...		....	...	
— 0.092	+ 0.07		9.548	— 42.00	+ 0.015	+ 0.10		— 0.03	— 0.3	

TABLE III (Continued).

Name of Star	2 Aquilae			Σ 2396		Σ 2400	
Approx. R. A.	h 18	m 37.1		h 18	m 43.9	h 18	m 44.6
Approx. Decl.	— 9°	8′.6		10°	39′.1	16°	8′.9
1904, June 28	....	...		....	...	....	...
July 1	— 0.04	+ 0.3	I	59.86	4.2	39.21	52.1
9	— .06	+ 0.5	I	.93	3.4	.20	2.0
12	— .02	+ 0.7	I	....	...	.19	2.6
14	— .08	+ 1.0	I	.88	3.8	....	...
1907, July 28	— .02	0.0		....	...	....	...
29	....	...		....	...	....	...
Aug. 2	....	...		....	...	....	...
5	....	...		....	...	....	...
7	— .04	0.0		....	...	....	...
Mean	— 0.043	+ 0.42		59.890	3.80	39.200	52.23

Name of Star	λ Aquilae			λ Ursae Minoris		β Cygni		
Approx. R. A.	19	1.2		19	16.8	19	26.9	
Approx. Decl.	— 5	1.5		88	59.8	27	45.6	
1904, July 1	+ 0.04	0.0	I	+ 0.43	— 0.3	....	...	
9	+ .01	— 0.5	I	+ .38	...	+ 0.05	— 0.3	I
12	....	...		+ .08	— 0.2	....	...	
14	....	...		— .47	...	+ .02	— 0.1	I
Aug. 10	+ .03	+ 0.1	I	+ .47	...	— .04	+ 0.5	I
16	+ .01	— 0.2	I	+ 1.11	...	— .01	0.0	I
22	+ .05	— 0.2	I	+ 1.08	— 0.1	.00	+ 0.4	I
26	....	...		+ 0.06	...	+ .03	— 0.6	I
Sept. 3	+ .04	— 0.7	I	+ .39	+ 0.5	+ .02	+ 1.1	I
9	....	...		+ .10	+ 0.4	— .04	— 0.4	I
Mean	+ 0.030	— 0.25		+ 0.363	+ 0.06	+ 0.004	+ 0.08	

TABLE III (Continued).

ε Aquilae		γ Lyrae		Name of Star	ζ Aquilae	
h	m	h	m		h	m
18	55.3	18	55.4	Approx. R. A.	19	1.0
14°	56′.3	32°	33′ 5	Approx. Decl.	13°	43′.3
....	...	....	...	1904, July 1	....	...
+ 0.02	+ 0.2 I	....	...	9	....	+ 0.4
....	...	0.00	+ 0.2 I	12	+ 0.02	... I
+ .04	0.0 I	....	...	14	+ .06	− 0.1 II
....	...	− .01	− 0.2 I	Aug. 10	....	...
....	...	....	...	16	....	...
....	...	....	...	22	....	...
....	...	....	...	26	+ .04	+ 1.3 I
....	...	....	...	Sept. 3	....	...
....	...	....	...	9	.00	+ 0.8 I
+ 0.030	+ 0.10	− 0.005	0.00	Mean	+ 0.030	+ 0.60

μ Aquilae		κ Aquilae		Name of Star	β Sagittae	
19	29.4	19	31.8	Approx. R. A.	19	36.8
7	10.6	− 7	14.3	Approx. Decl.	17	15.3
− 0.03	...	− 0.06	− 0.3	1904, Aug. 10	− 0.02	− 0.2 I
....	...	...	...	16	− .01	+ 0.6 I
....	...	+ .01	+ 0.5 I	22	....	+ 0.1 I
....	...	− .04	+ 0.2 I	26	.00	− 0.8
....	...	+ .02	+ 0.2 I	Sept. 3	....	...
....	...	− .05	− 0.1 I	9	+ .03	− 0.4 I
....	...	− .04	0.0			
....	...	+ .02	− 0.2 I			
....	...	− .01	+ 0.1			
....	...	.00	− 0.1			
− 0.03	...	− 0.017	+ 0.03	Mean	0.000	− 0.14

Table III (Continued).

Name of Star	17 Cygni			β Aquilae			γ Sagittae		
Approx. R. A.	h 19	m 42.8		h 19	m 50.6		h 19	m 54.5	
Approx. Decl.	33°	30′.4		6°	10′.1		19°	14′.0	
1904, Aug. 10	49.16	23.6	I	....	+ 0.2	I	....	...	
16	.16	2.5	I	....	...		+ 0.01	− 0.2	I
22	.15	2.6	I	+ 0.01	− 0.3	I	+ .01	+ 0.5	I
26	.16	2.3		+ .03	0.0	I	+ .03	− 0.1	I
Sept. 3	.15	3.0	I	.00	0.0	I	....	...	
9	.19	2.1	I	+ .01	− 0.7	I	....	...	
Mean	49.162	22.68		+ 0.012	− 0.16		+ 0.017	+ 0.07	
Name of Star	$\varkappa$ Cephei, *prec.*			γ Cygni			σ 683		
Approx. R. A.	20	12.1		20	18.8		20	27.9	
Approx. Decl.	77	25.5		39	57.1		48	53.6	
1904, Aug. 10	....	...		− 0.05	0.0	I	....	...	
16	− 0.04	+ 0.1	I	− .02	0.0	II	....	34.1	
22	....	...		....	...		56.97	3.7	
26	....	...		....	+ 0.3	II	6.96	3.8	
Sept. 3	....	...		− .02	− 0.1	II	6.96	4.1	
9	....	...		− .02	0.0	II	7.01	3.0	
Mean	− 0.04	+ 0.1		− 0.028	+ 0.04		56.975	33.74	
Name of Star	μ Aquarii			12 Y. C. 1879			ϑ Capricorni		
Approx. R. A.	20	47.5		20	51.9		21	0.6	
Approx. Decl.	− 9	20.4		80	11.8		− 17	36.6	
1904, Aug. 10	+ 0.03	0.0	I	− 0.04	...		....	...	
16	.00	+ 0.3		− .08	...		....	...	
22	....	+ 0.9		+ .01	+ 0.1		....	...	

TABLE III (Continued),

Σ 2619, *prec.*			15 Sagittae			ϑ Aquilae			31 Cygni		
h	m		h	m		h	m		h	m	
19	58.2		19	59.8		20	6.3		20	10.6	
47°	59′.7		16°	48′.8		− 1°	6′.4		46°	27′.2	
12.96	45.3		50.15	45.2		+ 0.05	+ 0.1	I	....	...	
3.07	5.4		.13	4.8		+ .02	+ 0.2	I	....	...	
2.95	5.8		.14	5.2		+ .03	− 0.2	I	− 0.05	+ 0.2	I
3.02	5.1		....	...		....	...		− .06	+ 0.5	I
3.04	5.5		.15	5.9		− .01	+ 0.3		− .04	0.0	
2.91	4.3		.15	4.3		....	...		− .06	− 0.3	I
12.992	45.23		50.144	45.08		+ 0.022	+ 0.10		− 0.052	+ 0.10	
ω² Cygni			Σ 2708, *seq.*			α Cygni			ε Cygni		
20	28.4		20	35.1		20	38.2		20	42.4	
48	51.9		38	18.3		44	56.4		33	36.8	
....	...		4.64	21.1		....	...		− 0.04	− 0.4	1
22.81	59 3		.69	1.2		0.00	− 0.1	II	....	...	
.86	8.4		.68	1.2		....	...		− .06	+ 0.4	II
.87	8.2		.66	1.2		....	...		− .07	− 0.5	I
.86	8.5		.70	1.5		....	...		− .03	0.0	I
.90	7.8		.74	1.1		− .02	+ 0.6	II	....	...	
22.860	58.44		4.685	21.22		− 0.010	+ 0.25		− 0.050	− 0.12	
Σ 2760, *seq.*			ζ Cygni			τ Cygni			α Equulei		
21	2.9		21	8.9		21	11.0		21	11.1	
33	45.1		29	50.2		37	38.4		4	51.3	
53.97	5.0		− 0.04	+ 0.5	I	....	...		+ 0.07	− 0.2	
.92	4.4		− .02	0.0	I	0.00	− 0.4		....	...	
.90	5.4		− .02	− 0.4	I	....	...		.00	− 0.7	

TABLE III (Continued).

Name of Star	μ Aquarii—Con.		12 Y. C. 1879—Con.		ϑ Capricorni—Con.	
1904, Aug. 26	0.00	− 0.1 I	− 0.04	+ 0.1	....	...
Sept. 3	....	...	.00	...	+ 0.01	+ 0.1
9	....	...	+ .20	− 0.6	....	...
Mean	+ 0.010	+ 0.28	+ 0.008	− 0.13	+ 0.01	+ 0.1

Name of Star	B.A.C. 7504		β Aquarii		ξ Aquarii	
	h	m	h	m	h	m
Approx. R. A.	21	18.6	21	26.6	21	32.7
Approx. Decl.	86°	38′.7	− 5°	59′.4	− 8°	16′.8
1903, Oct. 19	− 0.64	...	....	...	....	...
24	+ 0.15	+ 0.1	[+ 0.20]	... II	....	...
26	− 0.13	+ 0.4	....	...	....	...
27	− 0.75	+ 0.4	+ 0.10	+ 0.3 I	....	...
29	− 0.88	− 0.5	+ .04	− 0.3 I	....	...
1904, Aug. 10	+ 0.10	...	+ .01	− 0.5 I	....	...
16	+ 0.01	− 0.9	− .03	+ 0.2 I	....	...
22	− 0.18	− 0.6	....	...	− 0.01	0.0 I
26	− 0.17	− 0.3	+ .03	+ 0.4 II	− .01	− 0.6 I
Sept. 3	+ 0.05	− 0.5	.00	+ 0.6	....	...
9	+ 0.04	− 0.2	....	...	....	+ 0.5 I
Mean	− 0.218	− 0.23	+ 0.025	+ 0.12	− 0.010	− 0.03

Name of Star	α Aquarii		ι Pegasi		π^2 Pegasi	
Approx. R. A.	22	0.9	22	2.6	22	5.8
Approx. Decl.	− 0	46.9	24	52.8	32	42.7
1903, Oct. 19	+ 0.04	+ 0.4 I	....	...	− 0.07	− 0.5
24	....	...	+ 0.01	0.0 I	....	...

TABLE III (Continued).

Σ 2760, *seq.*—Con.		ζ Cygni—Con.		τ Cygni—Con.		α Equulei—Con.	
53.92	4.6	....	...	− 0.04	− 0.1 I	....	...
.96	5.0	....	...	....	...	− 0.01	+ 0.1 I
.99	4 9	+ 0.04	+ 0.1 I	....	...	+ .08	+ 0.2
53.943	4.88	− 0.010	+ 0.05	− 0.020	− 0.25	+ 0.035	− 0.15
74 Cygni		μ Cygni, *prec.*		π^2 Cygni		16 Pegasi	
h	m	h	m	h	m	h	m
21	33.1	21	39.9	21	43.3	21	48.7
39°	59′.2	28°	18′.8	48°	52′.2	25°	28′.7
[− 0.54]	... (I)	53.54	47.9 I	....	...	....	...
+ .03	0.0 I	.66	8.9 I	− 0.03	− 0.2 I	+ 0.01	+ 0.1 I
+ .04	+ 0.4 I	.64	7.6 (I)	− .03	+ 0.3	+ .01	− 0.5 I
− .02	0.0 I	.65	8.0 I	− .03	0.0 I	.00	− 0.4 I
....	− 0.6 I	....	8.0 I	....	0.0 I	....	− 0.6 1
− .04	− 0.4 I	....	...	....	...	....	...
....	...	....	...	....	...	....	...
....	...	....	...	....	...	....	...
....	...	....	...	....	...	....	...
+ .03	+ 0.5 I	....	...	....	...	....	...
....	...	....	...	....	...	....	...
+ 0.008	− 0.02	53.622	48.08	− 0.030	+ 0.02	+ 0.007	− 0.35
Σ 2877		33 Pegasi		σ Aquarii		α Lacertae	
22	9.7	22	19.1	22	25.6	22	27.4
16	43.2	20	22.1	− 11	9.8	49	47.6
44.54	13.1	5.19	4.4	+ 0.05	0.0	....	...
.55	3.5	.23	4.2	....	...	− 0.05	− 0.1 I

TABLE III (Continued).

Name of Star	α Aquarii—Con.		ι Pegasi—Con.		π^2 Pegasi—Con.	
1903, Oct. 26	+ 0.02	+ 0.2 I	....	...	− 0.02	− 0.2
27	....	...	− 0.01	− 0.7	....	...
29	....	...	− .01	+ 0.3 I	.00	− 0.1
Mean	+ 0.030	+ 0.30	− 0.003	− 0.13	− 0.030	− 0.27

Name of Star	η Aquarii		10 Lacertae		ζ Pegasi	
	h	m	h	m	h	m
Approx. R. A.	22	30.5	22	35.0	22	36.7
Approx Decl.	− 0°	36′.4	38°	38′.3	10	20.1
1903, Oct. 19	....	...	− 0.04	+ 0.4 (I)	....	...
24	....	...	− .08	− 0.1 I	....	...
26	− 0.01	− 0.5 I	....	...	− 0.03	0.0 I
27	....	...	....	...	+ .03	+ 0.5 I
29	+ .05	+ 0.4	....	...	....	...
Mean	+ 0.020	− 0.05	− 0.060	+ 0.15	0.000	+ 0.25

Name of Star	o Andromedae		α Pegasi		60 Pegasi	
Approx. R. A.	22	57.6	23	0.0	23	7.2
Approx. Decl.	41	48.9	14	41.6	26	20.0
1903, Oct. 19	....	...	+ 0.04	− 1.0	12.42	2.4
24	....	...	....	...	.40	2.7
26	....	...	− .04	− 0.5 II	.44	2.5[17]
27	− 0.02	− 0.4 I	....	...	.43	3.1
29	+ .02	+ 0.1 I	....	...	.47	2.9
Mean	0.000	− 0.15	0.000	− 0.75	12.432	2.72

Table III (Continued).

Σ 2877—Con.		33 Pegasi—Con.		σ Aquarii—Con.		α Lacertae—Con.	
44.50	13.8	5.20	4.5	+ 0.03	− 0.2	....	...
.54	2.9	.20	4.7	....	...	− 0.07	+ 0.5 I
.56	3.6	.20	4.5	....	...	− .05	+ 0.5 (I)
44.538	13.38	5.204	4.46	+ 0.040	− 0.10	− 0.057	+ 0.30
O Σ 477		Σ 2944, *seq.*		λ Aquarii		*O* Σ 536	
h	m	h	m	h	m	h	m
22	39.3	22	42.9	22	47.7	22	53.8
45°	31′.7	− 4°	43′.3	− 8°	5′.1	8°	51′.1
21.27	41.5	56.28	− 19.0	+ 0.05	− 0.7 I	46.13	7.5
.29	1.6	.41	9.1	+ .02	0.0 I	.09	8.6 [16]
.24	2.2	.40	8.0 [15]	....	...	.10	7.6
.24	1.7	.42	9.9	.00	− 0.5 I	.10	7.4
.30	2.1	.41	8.8	.00	0.0 I	.13	8.0
21.268	41.82	56.384	− 18.96	+ 0.018	− 0.30	46.110	7.82
τ Pegasi		κ Piscium		B.A.C. 8213		ι Piscium	
23	15.9	23	22.1	23	27.8	23	35.1
23	12.2	0	44.1	86	47.0	5	6.7
[− 0.15]	− 0.1 I	0.00	− 0.3	+ 0.84	...	+ 0.02	+ 0.3
− .02	+ 0.2 I	....	...	+ 0.01	+ 0.3	− .02	− 0.1 I
+ .01	+ 0.4 I	....	...	+ 0.80	− 0.3	....	...
− .02	0.0 I	....	...	+ 0.62	− 0.4	+ .04	...
+ .03	− 0.5	....	...	+ 0.08	+ 0.1	+ .04	+ 0.1 I
0.000	0.00	0.00	− 0.3	+ 0.470	− 0.08	+ 0.020	+ 0.10

TABLE III (Continued).

Name of Star	Σ 3041, *so.*, *seq.*		φ Pegasi		ω Piscium	
Approx. R. A.	h 23	m 43.0	h 23	m 47.6	h 23	m 54.4
Approx. Decl.	16°	31′.7	18°	35′.6	6°	20′.2
1903, Oct. 19	....	...	− 0.04	0.0	....	...
24	2.12	41.5	....	...	− 0.01	− 0.3 I
26	.11	1.9	+ .01	+ 0.3 I	+ .03	0.0 I
27	.14	2.0	.00	+ 0.1 I	....	...
29	.08	1.6	....	...	-- .04	− 0.3 I
Mean	2.112	41.75	− 0 010	+ 0.13	− 0.007	− 0.20

REFERENCE NOTES TO TABLE III.

1. ϑ Cassiopeae, $1^h\ 5^m$. Telescope remained unclamped by oversight.
2. Σ 125, $1^h\ 22^m$. Set telescope and saw star, but image too faint to observe.
3. α Ursae Minoris, $1^h\ 24^m$. Had to adjust mercury electric contact at clock just preceding this observation, the last one of the night.
4. Σ 142 (s), $1^h\ 34^m$. Attempted to observe north star of pair, but image too faint for satisfactory observation; abandoned.
5. ζ Ceti, $1^h\ 46^m$, and β Arietis, $1^h\ 49^m$. Correction of — 10″ assumed to reading of microscope I on both stars after comparison with readings on two other stars.
6. B. D. + 36°,566, $2^h\ 43^m$. Observed by mistake for 16 Persei. Star seemed to come earlier than was due; subsequently found circle setting 1° wrong in observing list.
7. 39 Tauri, $3^h\ 59^m$. Observation in R. A. rejected. No error found, but a correction of 0.1 rev. to one half of the series of chronograph signals would remove the discrepancy.
8. 13 Orionis, $5^h\ 2^m$. Observation in Decl. rejected. Seeing, very poor, 1.5 — 0.5; bisections both very late in field.
9. γ Orionis, $5^h\ 20^m$. Telescope not clamped; microscopes not read.
10. ϑ' Orionis, $5^h\ 30^m$. This star was added late to the observing list.
11. 15 Geminorum, $6^h\ 22^m$. Mercury electric contact at clock adjusted slightly immediately preceding this observation.
12. o Leonis, $9^h\ 36^m$. Mercury contact at clock adjusted preceding this observation. Armature correction on chronograph to beat of clock, + $0^s.246$ and + $0^s.280$ preceding and following respectively; from mean of five signals in each case.
13. δ^2 Corvi, $12^h\ 25^m$, April 3, 6, 16, 21.—This star stands quite alone; no other standard stars observed south of — 3° Decl.

Σ 1658, $12^h\ 30^m$. Observation in R. A. rejected. Three stars here: A 8.0, B. 9.8, C 8; A — B, 342°, 2″.0; A — C, 258°, 10″.9. A companion star could hardly have been observed by mistake.

15. Σ 2944 *seq.*, $22^h\ 42^m$. Correction of — 5″ assumed to reading of microscope II after comparison with readings on six neighboring stars.
16. $O\Sigma$ 536, $22^h\ 54^m$. Telescope remained unclamped by oversight.
17. 60 Pegasi, $23^h\ 7^m$. Mercury contact at clock adjusted preceding this observation.
18. Circle west; a few observations between $17^h\ 30^m$ and $18^h\ 37^m$ of right ascension.
19. The observed corrections are to the *Berliner Jahrbuch* of 1905, with Auwer's definitive correction and reduction to Newcomb applied.
20. The observed corrections are to the *Connaissance de Temps* of 1905,

GENERAL NOTES TO TABLE III.

1903, Oct. 19. Seeing in general very poor, making the stars appear from one half to one magnitude fainter than normal.

Oct. 24. Seeing began moderately good, became gradually worse, and ended very poor.

Oct. 26. Seeing in general, 4 — 4.5 (Steadiness of image — Quality of image, on scale of 0 to 5, the latter for the best). Micrometer motion rather hard, especially on stars of high declination.

Oct. 27. Seeing in general from 4 — 3 to 3 — 2.

Oct. 29. Record of four stars lost on chronograph near beginning of the night's work owing to failure of pen to mark. Seeing in general 4.5 — 4.

Nov. 2. Seeing very different on different stars. In general images unsteady making bisections seem uncertain.

1904, Jan. 13. Seeing in general 3 — 3. Thermometer + 13° to + 6° F.

Feb. 24. Seeing in general 3 — 3. Sky filling with light clouds. Thermometer + 18° to + 4° F.

March 3. Seeing in general 4.5 — 3.5.

March 22. Seeing in general 4.5 — 4.5.

April 3. Seeing in general 4.5 — 4.5. Micrometer contact rather hard.

April 6. Fine, calm night.

April 16. Seeing in general 4.5 — 4.5.

April 21. Seeing from 4.5 — 4 to 2 — 1 at close. Sky thick with clouds probably all the evening.

May 23. Seeing in general 4 — 3.

May 26. Seeing in general 4 — 3.

June 28. Seeing 4.5 — 4. Sky clouded up.

July 1. Seeing in general 4 — 3. Considerable disturbance, especially near zenith.

July 9. Seeing in general 4.5 — 4.

July 12. Seeing in general 4.5 — 4.

July 14. Seeing in general 4 — 3.

Aug. 10. Seeing in general 4.5 — 4.5 for zenith and north stars, 3 — 3 for equatorial stars.

Aug. 16. Seeing in general 4.5 — 4.5.

Aug. 22. Seeing poor at beginning and close but good in the middle time of observation.

Aug. 26. Seeing in general 4 — 3.

Sept. 3. Seeing in general 4 — 3.

Sept. 9. Seeing in general 3.5 — 3.

Nov. 11. Seeing in general 3.5 — 3.

Nov. 15. Seeing in general 5 — 4.5. Calm night. Stars of 7.5 mag. and fainter observed on edges of threads in both R. A. and Decl. Pointings divided equally in number between the two edges in each case. Threads of silk fibre mounted on the R. A. micrometer.

Nov. 18. Seeing poor. Sky clouding up. All stars observed on edges of threads.

Dec. 31. Increasing cloudiness. New set of fine spider webs mounted in the micrometer. Normal method of observing, bisecting star images on a single thread, resumed.

1905, Jan. 3. Seeing in general 4 — 3. Thermometer + 12° to + 8° F.

Jan. 13. Seeing poor, 2.5 — 2 in general. Thermometer from + 4° to — 4° F.

Jan. 16. Seeing in general 2 — 1. Thermometer + 17° to + 12° F.

Feb. 22. Seeing in general 4 — 4.

May 8. Seeing in general 4 — 3.

May 19. Seeing in general 4.5 — 3.5.

May 22. Seeing in general 3 — 3.

TABLE IV. CATALOGUE OF

Name of Star	Mag.₁	Screen	Mag.₂	Right Ascension 1905.0			Epoch 1900+	Prec. 1905	Sec. Var. 1850	Proper Motion	No. of Obs.
				h	m	s		s	s	s	
Arg. 559	6.4	..	6.1	0	1	40.738	3.82	+ 3.0777	+ 0.0181	+ 0.0289	5
22 Andromedae	5.3	I	6.4		5	22.697	3.82	....	....	...	2
γ Pegasi	3.3	I	5.8		8	20.561	3.81	....	....	....	3
Σ 23	7.6	..	7.5		12	36.652	3.82	3.0721	+ .0022	+ .0007	5
σ 6	7.1	..	6.9		15	1.986	3.82	3.1394	+ .0249	— .0118	5
44 Piscium	5.7	I	7.2	0	20	31.933	3.81	....	....	....	3
49 Piscium	7.1	..	7.2		25	50.938	3.82	+ 3.1141	+ .0114	— .0017	5
Σ 42	7.9	..	7.8		30	58.430	3.82	3.1741	+ .0210	+ .0131	5
54 Piscium	6.1	..	6.1		34	25.175	3.82	3.1479	+ .0148	— .0328	4
o Cassiopeiae	4.9	I	7.8		39	25.603	3.81	....	....	....	3
δ Piscium	4.6	I	7.1	0	43	45.174	3.81	....	....	....	2
γ Cassiopeiae	2.5	II	7.7		50	58.109	3.82	....	....	....	5
Σ 80	7.0	..	7.6		54	31.212	3.82	+ 3.0738	+ .0046	— .0026	5
ε Piscium	4.7	I	7.2		58	0.713	3.82	....	....	....	3
β Andromedae	2.3	II	4.8	1	4	24.567	4.70	....	....	....	7
ϑ Cassiopeiae	4.6	I	7.4	1	5	18.704	3.82	+ 3.6018	+ .0587	+ .0259	5
ζ' Piscium	5.5	I	6.3		8	46.007	4.40	....	....	....	8
f Piscium	5.6	I	7.1		12	53.876	4.01	....	....	....	9
ϑ' Ceti	3.8	I	6.4		19	16.497	4.69	....	....	....	4
Σ 125	7.9	..	8.1		22	7.970	4.55	+ 3.0671	+ .0054	+ .0186	7
α Ursae Minoris	2.3	II	6.1	1	24	41.83.	4.22	....	....	....	14
Σ 132	7.0	..	7.2		26	55.823	4.62	+ 3.2161	+ .0149	+ .0079	9
Σ 142 (so.)	8.2	..	8.7		34	48.865	4.80	3.2141	+ .0142	— .0026	5
107 Piscium	5.6	I	6.0		37	20.253	4.62	3.2706	+ .0169	— .0209	6
o Piscium	4.6	I	5.6		40	22.532	4.63	....	....	....	3

OBSERVED POSITIONS, 1905.0.

Declination 1905.0	Epoch 1900 +	Prec. 1905	Sec. Var. 1850	Proper Motion	No. of Obs.	Ephem.	Synonyms
° ′ ″		″	″	″			
+ 28 29 50.40	3.82	+ 20.048	— 0.006	— 0.188	5	..	
45 32 37.12	3.82	....	....	....	2	..	
+ 14 39 19.64	3.81	....	....	....	3	..	
— 0 12 34.40	3.82	+ 20.018	— .028	+ 0.110	5	..	
+ 37 42 26.60	3.82	+ 20.005	— .032	— 0.272	5	..	
+ 1 24 49.08	3.81	....	....	....	3	..	
15 30 46.12	3.82	+ 19.921	— .054	+ 0.020	5	..	
29 28 50.02	3.82	+ 19.865	— .065	— 0.405	5	..	
20 44 17.22	3.82	+ 19.822	— .070	— 0.373	4	..	
47 45 52.42	3.81	....	....	...	3	..	
+ 7 4 5.14	3.81	....	....	....	2	..	
60 12 9.28	3.82	....	....	....	5	..	
0 16 7.92	3.82	+ 19.484	— .108	— 0.107	5	..	
7 22 43.30	3.82	....	....	....	3	..	
35 7 1.48	4.84	....	....	....	7	..	
+ 54 38 41.88	3.82	+ 19.240	— .149	— 0.016	5	..	
7 4 23.39	4.40	....	....	....	9	N	
+ 3 6 51.74	4.01	....	....	....	9	..	
— 8 40 24.54	4.75	....	....	....	5	..	
+ 88 47 59.74	3.82	....	....	....	6	..	
— 0 38 29.61	4.55	+ 18.774	— .162	— 0.344	7	..	
+ 16 27 47.66	4.76	+ 18.623	— .176	— 0.204	10	..	
14 46 30.02	4.80	+ 18.357	— .190	— 0.020	5	..	
19 48 24.86	4.53	+ 18.267	— .196	— 0.670	5	..	
+ 8 40 47.36	4.72	....	....	....	4	..	

TABLE IV (Continued).

Name of Star	Mag.₁	Screen	Mag.₂	Right Ascension 1905.0	Epoch 1900+	Prec. 1905	Sec. Var. 1850	Proper Motion	No. of Obs.
				h m s		s	s	s	
ζ Ceti	3.8	I	7.0	1 46 46.257	4.65	....	....	....	7
β Arietis	3.0	I	5.2	49 23.388	4.36	....	....	....	5
α Arietis	2.2	II	7.6	2 1 48 946	4.96	....	....	....	5
γ Trianguli	4.3	I	6.4	11 39.775	4.47	....	....	....	6
ξ² Ceti	4.5	I	6.8	23 6.377	4.70	....	....	....	7
ϑ Persei	4.3	I	7.4	2 37 42.308	4.54	....	....	....	7
B. D + 36°, 566	6.7	..	6.9	43 31.215	4.44	+ 3.7302	+ 0.0322	....	6
16 Persei	4.5	I	7.3	44 34.91.	5.04	3.7577	+ .0334	— 0.0132	1
47 H. Cephei	5.5	..	5.6	53 25.628	4 99	....	....	....	4
ε Arietis	4.7	I	7.5	53 46.634	4.45	....	....	....	2
α Ceti	2.9	I	3.5	2 57 18.774	4.98	....	....	....	4
ζ Arietis	5.1	I	6.6	3 9 26.326	4.70	....	....	....	7
f Tauri	4.4	I	6.6	25 37.602	4.45	....	....	....	4
7 Tauri	6.1	..	6.5	28 48.874	4.59	+ 3.5455	+ .0180	+ .0007	8
δ Persei	3.3	I	6.6	36 9.372	4.64	....	....	....	3
η Tauri	3.1	II	7.1	3 41 50.122	4.57	....	....	....	3
ζ Persei	3.1	II	6.9	48 9.465	4.78	....	....	....	4
γ' Eridani	3.0	I	6.6	53 35.822	4.59	....	....	....	8
39 Tauri	6.2	..	6.3	59 42.652	4.61	+ 3.5339	+ .0152	+ .0116	6
O Σ 531	7.2	..	7.2	4 1 14.260	4.53	3.9740	+ .0258	+ .0150	7
B. A. C. 1235	6.7	..	7.4	4 6 32.58.	4.59	....	....	....	8
φ Tauri	5.1	I	6.1	14 30.522	4.59	+ 3.6858	+ .0165	— .0019	8
ε Tauri	3.9	I	6.9	23 4.069	4.59	....	. ..	....	5
m Persei	6.3	..	6.6	26 43.640	4.69	....	....	....	4
τ Tauri	4.5	I	7.6	36 32.497	4.53	....	....	....	5

TABLE IV (Continued).

Declination 1905.0	Epoch 1900 +	Prec. 1905	Sec. Var. 1850	Proper Motion	No. of Obs.	Ephem.	Synonyms
° ′ ″		″	″	″			
− 10 48 15.28	4.62	....	....	....	6	..	
+ 20 20 37.75	4.46	....	....	....	6	..	
23 20 48.48	4.96	....	....	....	5	..	
33 24 29.10	4.47	....	....	....	6	..	
8 2 4.18	4.70	....	....	....	7	..	
+ 48 49 37.17	4.54	....	....	....	7	..	
36 55 51.88	4.44	+ 15.161	− 0.358	....	6	..	
37 55 39.7.	5.04	+ 15.097	− .362	− 0.101	1	..	
79 2 38.14	4.99	....	....	....	4	..	
20 57 38.34	4.45	....	....	....	2	..	
+ 3 43 2.24	4.92	....	....	....	2	..	
20 51 33.55	4.70	....	....	....	7	..	
12 36 41.22	4.45	....	....	....	4	..	
24 8 45.86	4.59	+ 12.287	− .408	− 0.030	8	..	
47 29 3.14	4.64	....	....	....	3	..	
+ 23 48 42.16	4.57	....	....	....	3	..	
+ 31 36 6.68	4.78	....	....	....	4	..	
− 13 46 41.84	4.59	....	....	....	8	..	
+ 21 45 10.39	4.53	+ 10.046	− .448	− 0.138	7	..	
37 49 29.60	4.53	+ 9.930	− .505	− 0.215	7	..	
85 18 17.	....	....	....	....	..	C	
+ 27 7 26.14	4.59	+ 8.906	− .480	− 0.078	8	..	
18 58 12.28	4.59	....	....	....	5	..	
42 51 40.94	4.69	....	....	....	4	..	
22 46 30.11	4.53	....	....	....	5	..	

TABLE IV (Continued).

Name of Star	Mag.₁	Screen	Mag.₂	Right Ascension 1905.0			Epoch 1900+	Prec. 1905	Sec. Var. 1850	Proper Motion	No. of Obs.
				h	m	s		s	s	s	
π' Orionis	3.5	I	6.6	4	44	40.938	4.56	....	....	....	5
i Tauri	5.3	I	8.0		45	48.911	4.63	....	....	....	3
Aurigae	2.8	I	6.0		50	48.301	4.52	....	....	....	2
ζ Aurigae	3.8	I	6.6		55	50.096	4.86	....	....	....	2
11 Orionis	5.1	I	6.9		59	8.350	4.29	....	....	....	3
13 Orionis	6.4	..	6.4	5	2	25.958	4.44	+ 3.2856	+ 0.0060	− 0.0002	6
τ Orionis	3.6	I	6.4		12	59.606	4.38	....	....	....	5
γ Orionis	2.1	II	6.0		20	2.140	4.64	....	....	....	4
χ Aurigae	4.9	I	7.7		26	32.622	4.52	....	....	....	2
ϑ' Orionis	4.9	I	6.4		30	42.965	4.97	+ 2.9464	+ .0041	.0000	4
Groombridge 944	6.2	..	6.3	5	31	28.057	4.46	....	....	....	9
κ Orionis	2.2	II	7.7		43	15.077	4.53	....	....	....	8
South 503	6.6	..	7.0		50	37.566	4.61	+ 3.4033	+ .0022	+ .0264	5
ϑ Aurigae	2.9	II	7.6		53	14.584	4.76	....	....	....	4
1 Geminorum	4.4	I	6.5		58	20.759	4.39	....	....	....	3
ν Orionis	4.6	I	6.8	6	2	8.874	4.58	....	....	....	4
Geminorum	(3.5)	I	6.6		9	8.606	4.91	....	....	....	3
μ Geminorum	3.1	I	6.6		17	12.817	4.49	....	....	....	3
15 Geminorum	6.6	..	6.5		22	6.850	4.70	+ 3.5791	− .0007	− .0023	6
γ Geminorum	2.3	II	7.6		32	13.472	4.81	....	....	....	5
OΣ 154	6.9	..	7.0	6	37	38.293	4.70	+ 4.2074	− .0077	− .0014	6
ϑ Geminorum	3.8	I	5.8		46	31.757	4.70	....	....	....	6
ϑ Canis Majoris	4.2	I	7.5		49	46.612	4.63	....	....	....	7
51 H. Cephei	5.2	..	5.2		56	11.77.	4.63	....	....	....	7
51 Geminorum	5.1	I	6.7	7	7	55.000	4.62	....	....	....	5

TABLE IV (Continued).

Declination 1905.0			Epoch 1900 +	Prec. 1905	Sec. Var. 1850	Proper Motion	No. of Obs.	Ephem.	Synonyms
°	′	″		″	″	″			
+ 6	47	44.59	4.56	....	....	....	5	N	π^3 Orionis
18	40	43.14	4.63	....	....	....	3	..	
33	0	57.82	4.52	....	....	....	2	..	
40	56	15.00	4.86	....	....	....	2	..	
15	16	19.95	4.29	....	....	....	3	..	
+ 9	21	22.50	4.56	+ 4.983	− 0.464	− 0.383	5	..	
− 6	56	48.03	4.38	....	....	....	5	..	
+ 6	15	50.22	4.46	....	....	....	4	N	
+ 32	7	20.20	4.52	....	....	....	2	..	
− 5	28	41.30	4.97	+ 2.564	− .426	+ 0.013	4	..	
+ 85	9	2.80	4.00	....	....	....	3	..	
− 9	42	10.78	4.53	....	....	....	8	..	
+ 13	55	20.26	4.61	+ 0.816	− .507	− 0.480	5	..	
37	12	23.14	4.76	....	....	....	4	..	
23	16	7.72	4.39	....	....	....	3	N	
+ 14	46	48.43	4.58	....	....	....	4	..	
22	32	5.06	4.91	....	....	....	3	..	
22	33	45.80	4.49	....	....	....	3	..	
20	50	52.67	4.70	− 1.931	− .518	− 0.052	6	..	
16	28	51.08	4.81	....	....	....	5	..	
+ 40	43	15.74	4.67	− 3.278	− .605	− 0.160	5	..	
+ 34	4	34.33	4.70	....	...	....	6	..	
− 11	55	9.04	4.68	....	....	....	5	N	
+ 87	11	56.36	4.74	....	....	....	4	..	
16	19	14.03	4.63	....	....	....	7	N	

TABLE IV (Continued).

Name of Star	Mag.₁	Screen	Mag.₂	Right Ascension 1905.0	Epoch 1900+	Prec. 1905	Sec. Var. 1850	Proper Motion	No. of Obs.
				h m s		s	s	s	
β Canis Minoris	3.2	I	7.0	7 21 59.972	5.01	....	....	....	3
26 Lyncis	5.5	..	5.5	47 47.867	4.26	....	....	....	2
ω' Cancri	6.0	..	6.3	55 11.072	4.22	....	....	....	4
B. A. C. 2320	7.3	..	7.4	8 3 26.547	4.22	....	....	....	4
P. vii, 321	7.0	..	7.2	5 41.482	4.22	+ 3.8060	− 0.0195	− 0.0365	4
β Cancri	3.7	I	5.2	8 11 21.879	4.26	....	....	....	2
σ 294	6.1	..	6.6	18 16.990	4.22	+ 4.0742	− .0300	+ .0003	4
30 Monocerotis	3.9	I	4.9	20 54.868	4.22	....	....	....	3
η Cancri	5.5	I	7.1	27 13.013	4.24	....	....	....	3
σ Hydrae	4.6	I	7.6	33 47.572	4.21	....	....	....	3
Σ 1263, *prec.*	7.6	..	8.1	8 38 54.388	4.22	+ 3.9988	− .0331	− .0265	4
σ² Cancri	5.6	I	6.8	48 27.066	4.22	....	....	....	4
ι Ursae Majoris	3.4	I	4.8	52 42.444	4.22	....	....	....	4
75 Cancri	6.2	..	6.3	9 3 12.145	4.22	3.5475	− .0195	− .0093	4
π Cancri	5.5	..	5.5	7 5.760	4.22	3.3243	− .0114	− .0364	4
σ 331	8.4	..	8.2	9 9 41.342	4.22	+ 3.4707	− .0171	− .0090	4
α Lyncis	3.4	I	4.8	15 16.232	4.22	....	....	....	4
41 Lyncis	5.5	..	6.3	22 26.582	4.22	+ 3.9511	− .0429	− .0005	4
o Leonis	3.9	I	5.8	36 4.899	4.21	....	....	....	3
ε Leonis	3.2	I	6.0	40 27.663	4.24	....	....	....	2
μ Leonis	4.1	I	6.0	9 47 21.761	4.23	....	....	....	3
19 Leonis Minoris	5.3	I	7.4	51 52.145	4.22	....	....	....	4
π Leonis	4.8	..	4.8	55 11.677	4.25	....	....	....	6
γ' Leonis	2.5	I	5.3	10 14 44.23.	4.22	....	....	....	1
B. A. C. 3495	5.7	..	5.7	15 56.17.	4.25	....	....	....	6

TABLE IV (Continued).

Declination 1905.0	Epoch 1900 +	Prec. 1905	Sec. Var. 1850	Proper Motion	No. of Obs.	Ephem.	Synonyms
° ′ ″		″	″	″			
+ 8 28 52.50	5.01	....	....	....	2	..	
47 48 40.88	4.26	....	....	....	2	..	
25 39 11.48	4.22	....	....	....	4	..	
88 55 9.	....	....	....	....	..	N	Gr. 1119
32 45 21.82	4.22	− 10.450	− 0.466	− 0.658	4	..	
+ 9 28 43.15	4.26	....	....	....	2	..	
+ 42 18 40.15	4.22	− 11.377	− .492	+ 0.002	4	..	
− 3 35 45.72	4.22	....	....	....	2	..	
+ 20 45 51.32	4.24	....	....	....	3	..	
3 40 30.92	4.21	....	....	....	3	..	
+ 42 1 57.62	4.22	− 12.813	− .445	− 0.650	4	..	
30 56 22.43	4.22	....	....	....	4	..	
48 24 54.25	4.22	....	....	....	4	..	
27 1 21.65	4.22	− 14.373	− .359	− 0.392	4	..	
15 22 44.95	4.22	− 14.606	− .323	+ 0.235	4	..	
+ 23 46 24.62	4.22	− 14.762	− .340	− 0.161	4	..	
34 47 40.57	4.22	....	....	....	4	..	40 Lyncis
46 1 5.78	4.22	− 15.495	− .368	− 0.130	4	..	
10 19 29.11	4.21	....	....	....	3	..	
24 12 43.01	4.24	....	....	....	2	..	
+ 26 27 16.97	4.23	....	....	....	3	..	
41 30 29.84	4.22	....	....	....	4	..	
8 30 0.41	4.25	....	....	....	6	..	
20 19 19.5.	4.22	....	....	....	1	..	
84 44 6.8.	4.22	....	....	....	1	C	

TABLE IV (Continued).

Name of Star	Mag._1	Screen	Mag._2	Right Ascension 1905.0			Epoch 1900+	Prec. 1905	Sec. Var. 1850	Proper Motion	No. of Obs.
				h	m	s		s	s	s	
σ 362	6.8	..	6.9	10	18	18.640	4.25	+ 3.1345	— 0.0645	— 0.0165	5
ρ Leonis	4.0	I	7.4		27	48.621	4.25	....	....	....	6
41 Leonis Minoris	5.2	I	8.0		38	15.143	4.29	....	....	....	2
Σ 1472	7.8	..	8.2		41	58.654	4.26	+ 3.1798	— .0098	— .0015	5
l Leonis	5.6	I	6.2		44	15.865	4.26	....	....	....	4
Groombridge 1706	6.3	..	6.3	10	52	22.473	4.26	....	....	....	4
β Ursae Majoris	2.6	II	7.0		56	6.932	4.28	....	....	....	2
α Ursae Majoris	2.0	II	6.0		57	52.381	4.24	....	....	....	2
σ 377	8.5	..	8.8	11	5	35.850	4.26	+ 3.7968	— .1012	+ .0012	5
Σ 1517	7.1	..	7.1		8	41.685	4.27	3.1841	— .0132	— .0276	2
Σ 1516, *prec.*	7.8	..	7.8	11	8	59.085	4.28	+ 4.1002	— .1728	— .0950	2
ν Ursae Majoris	3.6	I	6.4		13	20.966	4.24	....	....	....	2
τ Leonis	5.3	I	7.8		23	3.151	4.26	....	....	....	2
λ Draconis	3.8	I	6.1		25	46.409	4.26	....	....	....	4
υ Leonis	4.5	I	7.5		32	5.073	4.27	....	....	....	3
62 Ursae Majoris	6.0	..	6.0	11	36	37.686	4.26	+ 3.1583	— .0194	— .0278	5
χ Ursae Majoris	3.8	I	4.7		41	2.234	4.28	....	....	....	3
β Leonis	2.6	II	7.7		44	12.885	4.24	....	....	....	2
β Virginis	3.9	I	6.7		45	44.839	4.28	....	....	....	2
γ Ursae Majoris	2.7	II	6.6		48	50.288	4.27	....	....	....	2
π Virginis	4.9	I	7.7	11	56	0.309	4.82	....	....	....	4
ο Virginis	4.3	I	6.8	12	0	22.239	4.86	....	....	....	6
Σ 1607	7.8	..	8.3		6	45.712	4.68	+ 3.0430	— .0201	— .0044	8
2 Canum Venat.	5.8	..	5.8		11	22.012	4.64	....	....	....	3
B. A. C. 4165	6.5	..	6.9		14	24.411	4.62	....	....	....	10

TABLE IV (Continued).

Declination 1905.0			Epoch 1900 +	Prec. 1905	Sec. Var. 1850	Proper Motion	No. of Obs.	Ephem.	Synonyms
°	′	″		″	″	″			
+ 6	10	34.66	4.25	− 18.106	− 0.192	− 0.076	5	..	
9	47	44.39	4.24	....	....	....	5	..	
23	41	9.28	4.29	....	....	....	2	..	
13	31	54.84	4.26	− 18.897	− .153	− 0.070	5	..	
11	2	52.98	4.26	....	....	....	4	..	
+ 78	16	45.37	4.24	....	....	....	2	..	
56	53	30.76	4.28	....	....	....	2	N	
62	15	50.57	4.24	....	....	....	2	..	
66	32	45.00	4.26	− 19.485	− .128	+ 0.032	5	..	The following one of three close stars.
20	39	55.90	4.27	− 19.548	− .101	− 0.141	2	..	
+ 73	59	22.35	4.28	− 19.553	− .129	+ 0.107	2	..	
33	36	46.08	4.24	....	....	....	2	..	
3	22	46.55	4.26	....	....	....	2	..	
+ 69	51	19.71	4.26	....	....	....	4	..	
− 0	17	57.05	4.27	....	....	....	4	..	
+ 32	16	19.20	4.26	− 19.944	− .043	+ 0.021	5	..	
48	18	22.05	4.28	....	....	....	3	..	
15	6	11.25	4.24	....	....	....	2	..	
2	18	0.46	4.28	....	....	....	2	N	
54	13	22.90	4.27	....	....	....	2	..	
+ 7	8	38.09	4.82	....	....	....	3	..	
9	15	38.35	4.76	....	....	....	5	..	
36	37	3.40	4.68	− 20.039	+ .016	+ 0.012	8	..	
41	11	19.91	4.26	....	....	....	2	..	
88	13	35.1.	5.39	....	....	....	1	N	6 Urs. Min., Br. 1672

TABLE IV (Continued).

Name of Star	$Mag._1$	Screen	$Mag._2$	Right Ascension 1905.0			Epoch 1900 +	Prec. 1905	Sec. Var. 1850	Proper Motion	No. of Obs.
				h	m	s		s	s	s	
η Virginis	4.2	I	6.4	12	15	2.742	4.60	....	....	....	4
δ^2 Corvi	3.1	I	6.5		24	56.878	4.64	....	....	....	6
β Canum Venat.	4.5	I	5.9		29	13.972	4.27	....	....	....	4
Σ 1658	8.0	..	7.7		30	17.473	5.04	+ 3.0477	— 0.0008	+ 0.0106	3
ρ Virginis	5.1	I	6.7		37	4.591	4.73	....	....	....	3
Σ 1678	6.3	..	6.3	12	40	40.695	4.88	+ 3.0097	— .0036	— .0042	4
33 Virginis	5.7	..	5.7		41	32.945	4.88	3.0296	— .0012	+ .0186	4
32² Camelop.	6.2	..	6.2		48	25.26.	4.88	....	....	....	4
ε Virginis	3.1	I	5.2		57	26.874	4.88	....	....	....	4
ϑ Virginis	4.4	I	7.2	13	5	1.818	4.88	....	....	....	4
σ 434	7.5	..	7.2	13	9	57.338	4.88	+ 3.1494	+ .0111	— .0155	4
α Virginis	1.2	II	7.2		20	11.209	4.88	....	....	....	4
ζ Virginis	3.5	I	6.6		29	51.079	4.88	....	....	....	2
m Virginis	5.3	I	6.8		36	37.493	4.89	....	....	....	2
τ Bootis	4.7	I	7.6		42	44.861	4.40	....	....	....	1
η Ursae Majoris	2.3	II	3.7	13	43	47.921	5.37	....	....	...	2
η Bootis	3.1	I	4.0		50	9.687	5.04	....	....	....	3
τ Virginis	4.5	I	7.5		56	48.645	4.90	...	....	....	2
94 Virginis	6.8	..	7.2	14	1	15.813	4.87	....	....	....	2
4 Ursae Minoris	4.9	I	5.6		9	12.490	4.88	....	....	....	4
λ Virginis	4.6	I	5.3	14	13	58.041	4.88	....	....	....	4
B. A. C. 5140	7.0	..	7.4	15	7	38.498	4.50	....	....	....	3
β Librae	2.7	I	6.9		11	53.631	4.51	....	....	....	5
μ' Bootis	4.6	I	6.4		20	54.068	4.51	....	....	....	5
β Coronae Borealis	3.9	I	7.5		23	54.718	4.52	....	....	....	2

TABLE IV (Continued).

Declination 1905.0	Epoch 1900 +	Prec. 1905	Sec. Var. 1850	Proper Motion	No. of Obs.	Ephem.	Synonyms
° ′ ″		″	″	″			
− 0 8 19.90	4.71	....	....	....	3	..	
− 15 59 11.48	4.64	....	....	....	6	..	
+ 41 52 25.10	4.27	....	....	....	4	..	8 Canum Venat.
7 58 6.10	4.88	− 19.873	+ 0.062	− 0.093	4	..	
10 45 32.82	4.73	....	....	....	3	N	
+ 14 53 35.72	4.88	− 19.733	+ .080	+ 0.004	4	..	
10 4 14.92	4.88	− 19.719	+ .084	− 0.466	4	..	
83 55 45.	....	....	....	....	..	C	
+ 11 28 10.52	4.88	....	....	....	4	..	
− 5 1 54.74	4.88	....	....	....	4	..	
− 10 51 30.25	4.88	− 19.122	+ .139	− 0.310	4	..	
− 10 39 56.04	4.88	....	....	....	4	..	
− 0 6 37.06	4.88	....	....	....	2	..	
− 8 13 25.60	4.89	....	....	....	2	..	
+ 17 55 48.7.	4.40	....	....	....	1	N	
+ 49 47 14.28	5.37	....	....	....	2	..	
18 52 25.21	5.04	....	....	....	3	..	
+ 2 0 15.23	4.90	....	....	....	2	N	
− 8 26 18.64	4.87	....	....	....	2	N	
+ 77 59 37.4.	5.35	....	....	....	1	..	
− 12 56 2.58	4.88	....	....	....	4	..	
+ 87 35 56.	....	....	....	...	..	N	Gr. 2283
− 9 1 57.73	4.52	....	....	....	4	..	
+ 37 42 36.45	4.50	....	....	....	4	..	
29 25 58.56	4.52	....	....	....	2	..	

TABLE IV (Continued).

Name of Star	Mag.[1]	Screen	Mag.[2]	Right Ascension 1905.0			Epoch 1900 +	Prec. 1905	Sec. Var. 1850	Proper Motion	No. of Obs.
				h	m	s		s	s	s	
α Coronae Borealis	2.6	II	7.4	15	30	39.920	4.52	....	....	....	4
α Serpentis	2.9	I	6.7		39	35.293	4.50	....	....	....	4
u Serpentis	3.5	I	7.0		44	39.664	4.52	....	....	....	2
ζ Ursae Minoris	4.5	..	4.5		47	26.250	4.52	....	....	....	2
39 Serpentis	6.4	..	6.6		48	46.576	4.51	+ 2.8019	+ 0.0033	— 0.0114	5
Σ 1993, *prec.*	8.2	..	8.3	15	55	29.352	4.51	+ 2.7085	+ .0040	— .0006	5
σ 502	7.0	..	7.9		57	6.583	4.50	2.5012	+ .0030	— .0068	3
ρ Coronae	5.6	..	5.8		57	24.660	4.52	2.3085	+ .0029	— .0167	2
φ Herculis	4.5	I	7.4	16	5	46.529	4.50	....	....	....	4
δ Ophiuchi	2.8	I	4.6		9	21.967	4.51	....	....	....	2
σ² Coronae Borealis	5.4	..	5.4	16	11	7.275	4.52	....	....	....	2
τ Herculis	4.2	I	7.2		16	53.056	4.51	....	....	....	2
γ Herculis	4.0	I	7.1		17	43.750	4.51	....	....	....	3
OΣ 311	7.5	..	7.7		23	38.985	4.52	+ 2.6014	+ .0036	— .0026	4
λ Ophiuchi	4.0	..	4.0		26	7.301	4.51	....	....	....	3
β Herculis	3.0	I	6.0	16	26	8.139	4.51	....	....	....	2
ζ Ophiuchi	2.8	II	7.3		31	55.582	4.52	....	....	....	3
ζ Herculis	3.2	I	6.3		37	42.253	4.50	....	....	....	2
η Herculis	3.8	I	7.1		39	38.306	4.52	....	....	....	2
κ Ophiuchi	3.4	I	6.5		53	10.258	4.50	....	....	....	2
ε Ursae Minoris	4.5	I	6.6	16	55	40.894	4.52	....	....	....	4
Σ 2120	7.3	..	7.2	17	0	59.620	4.52	+ 2.3789	+ .0031	— .0013	4
η Ophiuchi	2.6	I	4.8		4	55.736	4.52	....	....	....	4
ζ Draconis	3.4	I	6.8		8	30.60.	4.49	....	....	....	1
δ Herculis	3.5	I	6.5		11	7.740	4.52	....	....	....	2

TABLE IV (Continued).

Declination 1905.0			Epoch 1900 +	Prec. 1905	Sec. Var. 1850	Proper Motion	No. of Obs.	Ephem.	Synonyms
°	′	″		″	″	″			
+ 27	2	2.76	4.52	....	....	....	4	..	
+ 6	43	26.84	4.50	....	....	....	4	..	
− 3	8	23.23	4.52	....	....	....	2	N	
+ 78	5	13.	4.52	....	....	....	..	..	
13	29	37.16	4.51	− 10.863	+ 0.342	− 0.581	5	..	
+ 17	38	43.58	4.51	− 10.364	+ .340	+ 0.008	5	..	
26	26	15.70	4.50	− 10.242	+ .315	+ 0.030	3	..	
33	35	23.45	4.52	− 10.221	+ .287	− 0.776	2	..	
+ 45	11	1.62	4.50	....	....	....	4	..	
− 3	27	0.46	4.51	....	....	....	2	..	
+ 34	5	56.82	4.52	....	....	....	2	..	
46	32	22.20	4.51	....	....	....	2	..	
19	22	33.10	4.51	....	....	....	3	N	
21	6	35.68	4.52	− 8.182	+ .348	− 0.127	4	..	
2	11	29.25	4.51	....	....	....	2	N	
+ 21	41	46.14	4.51	....	....	....	2	..	
− 10	22	29.94	4.52	....	....	....	3	..	
+ 31	46	28.71	4.50	....	....	....	2	N	
39	6	9.51	4.52	....	....	....	2	..	
9	31	20.80	4.50	....	....	....	2	..	
+ 82	11	40.	....	....	....	....	..	C	
+ 28	13	16.38	4.52	− 5.105	+ .336	+ 0.001	4	..	
− 15	36	27.36	4.52	....	....	....	4	..	
+ 65	49	53.2.	4.49	....	....	....	1	N	
24	57	2 86	4.52	....	....	....	2	N	

TABLE IV (Continued).

Name of Star	Mag.1	Screen	Mag.2	Right Ascension 1905.0	Epoch 1900+	Prec. 1905	Sec. Var. 1850	Proper Motion	No. of Obs.
				h m s		s	s	s	
π Herculis	3.3	I	6.3	17 11 44.24.	4.53	....	....	....	1
σ Ophiuchi	4.4	I	7.4	21 48.01.	4.49	....	....	....	1
β Draconis	3.0	I	6.5	28 17.18.	4.49	....	....	....	1
α Ophiuchi	2.5	II	7.6	30 31.464	5.75	....	....	....	5
ω Draconis	5.0	I	7.6	37 30.367	4.52	....	....	....	4
β Ophiuchi	2.9	..	2.9	17 38 46.750	7.57	....	....	....	1
μ Herculis	3.6	I	4.6	42 44.393	6.56	....	....	....	3
γ Ophiuchi	3.7	..	3.7	43 7.707	7.58	....	....	....	3
ν Ophiuchi	3.5	I	4.7	53 47.761	5.74	....	....	....	5
γ Draconis	2.5	II	7.5	54 24.00.	4.53	....	....	....	1
70 (a) Ophiuchi	4.2	..	4.2	18 0 39.240	7.58	....	....	....	5
δ Ursae Minoris	4.7	I	6.0	2 55.20.	4.52	....	....	....	4
μ Sagittae	4.1	..	4.1	8 4.930	5.53	....	....	....	3
B. D. + 64°, 1253	7.4	..	7.4	13 48.810	4.52	+ 0.2478	— 0.0008	— 0.0051	4
η Serpentis	3.4	..	3.4	16 23.653	6.97	....	....	....	5
109 Herculis	3.9	..	3.9	18 19 38.99.	7.58	....	....	....	1
χ Draconis	3.8	I	6.9	22 46.199	4.52	....	....	....	4
29 Scuti	5.5	..	6.5	26 9.548	4.52	+ 3.3270	— .0007	.0000	4
1 Aquilae	4.0	..	4.0	30 2.259	6.04	....	....	....	4
α Lyrae	0.4	III	6.0	33 43.29.	4.53	....	....	....	1
2 Aquilae	4.8	I	7.6	18 37 4.335	5.54	....	....	....	6
Σ 2396	7.7	..	7.7	43 59.890	4.51	+ 2.8258	+ .0011	+ .0074	3
Σ 2400	8.1	..	7.9	44 39.200	4.51	2.6928	+ .0009	— .0023	3
ε Aquilae	4.3	I	7.4	55 18.667	4.50	....	....	....	2
γ Lyrae	3.6	I	6.5	55 23.372	4.52	....	....	....	2

TABLE IV (Continued).

Declination 1905.0	Epoch 1900 +	Prec. 1905	Sec. Var. 1850	Proper Motion	No. of Obs.	Ephem.	Synonyms
° ′ ″		″	″	″			
+ 36 54 57.4.	4.53	....	....	....	1	..	
4 13 21.3.	4.49	....	....	....	1	N	
52 22 17.1.	4.49	....	....	....	1	..	
12 37 43.80	5.75	....	....	....	5	..	
68 48 6.86	4.52	....	....	....	4	..	
+ 4 36 25.05	7.57	....	....	...	1	N	
27 46 33.56	6.56	....	....	....	3	..	
+ 2 44 33.52	7.58	....	....	....	3	B	
— 9 45 44.23	5.74	....	....	....	4	N	
+ 51 29 59.1.	4.53	....	....	....	1	..	
+ 2 31 17.9.	7.58	....	....	....	5	C	
+ 86 36 48.93	4.52	....	....	....	2	..	
— 21 5 2.85	5.53	....	....	....	3	..	
+ 64 43 9.98	4.52	+ 1.208	+ 0.036	+ 0.041	4	..	
— 2 55 26.13	6.97	....	....	....	5	..	
+ 21 43 32.6.	7.58	....	....	....	1	B	
+ 72 41 30.20	4.51	....	....	....	3	..	
— 10 51 42.00	4.52	+ 2.283	+ .482	— 0.018	4	..	
— 8 18 38.95	6.04	....	....	....	4	..	
+ 38 41 41.5.	4.53	....	....	....	1	..	
— 9 8 37.25	5.54	....	....	....	6	N	
+ 10 39 3.80	4.51	+ 3.826	+ .406	— 0.504	3	..	
16 8 52.23	4.51	+ 3.881	+ .384	+ 0.046	3	..	
14 56 20.04	4.50	....	....	....	2	N	
+ 32 33 32.00	4.52	....	....	....	2	..	

TABLE IV (Continued).

Name of Star	Mag.₁	Screen	Mag.₂	Right Ascension 1905.0			Epoch 1900+	Prec. 1905	Sec. Var. 1850	Proper Motion	No. of Obs.
				h	m	s		s	s	s	
ζ Aquilae	3.3	I	6.9	19	1	2.645	4.60	....	....	....	4
λ Aquilae	3.6	I	7.0		1	12.477	4.60	....	....	....	6
λ Ursae Minoris	6.5	..	6.8		16	47.52.	4.60	....	....	....	10
β Cygni	3.2	I	6.5		26	53.404	4.62	....	....	....	8
μ Aquilae	4.6	..	4.6		29	26.91.	4.49	....	....	....	1
κ Aquilae	4.9	I	6.5	19	31	46.873	4.60	....	....	....	9
β Sagittae	4.6	I	6.7		36	46.916	4.64	....	....	....	4
17 Cygni	5.1	I	7.5		42	49.162	4.65	+ 2.2750	+ 0.0012	+ 0.0006	6
β Aquilae	3.8	I	7.7		50	38.825	4.66	....	....	....	4
γ Sagittae	3.8	I	6.6		54	31.940	4.64	....	....	....	3
Σ 2619, *prec.*	8.1	..	8.5	19	58	12.992	4.65	+ 1.7815	− .0005	− .0122	6
15 Sagittae	5.7	..	5.7		59	50.144	4.65	2.7227	+ .0002	− .0279	5
ϑ Aquilae	3.4	I	6.9	20	6	24.240	4.64	....	....	....	4
31 Cygni	3.9	I	6.2		10	38.398	4.66	....	....	....	4
κ Cephei, *prec.*	4.6	I	8.0		12	5.99.	4.62	....	....	....	1
γ Cygni	2.5	II	7.1	20	18	49.089	4.65	....	....	....	4
σ 683	6.9	..	6.9		27	56.975	4.66	+ 1.8490	+ .0003	− .0014	4
ω² Cygni	5.5	..	5.5		28	22.860	4.65	1.8506	+ .0004	+ .0010	5
Σ 2708, *seq.*	7.0	..	6.8		35	4.685	4.65	2.2493	+ .0026	+ .0157	6
α Cygni	1.6	II	7.2		38	11.573	4.66	....	....	....	2
ε Cygni	2.7	I	6.1	20	42	21.991	4.64	....	....	....	4
μ Aquarii	4.8	I	6.7		47	31.859	4.63	....	....	....	3
12 Year Cat., 1879	5.4	..	5.4		51	55.115	4.65	....	....	....	6
ϑ Capricorni	4.3	..	4.3	21	0	36.50.	4.67	....	....	....	1
Σ 2760, *seq.*	7.8	..	7.7		2	53.943	4.65	+ 2.4498	+ .0055	− .0014	6

TABLE IV (Continued).

Declination 1905.0	Epoch 1900 +	Prec. 1905	Sec. Var. 1850	Proper Motion	No. of Obs.	Ephem.	Synonyms
° ′ ″		″	″	″			
+ 13 43 19.32	4.60	....	....	....	4	..	
− 5 1 31.27	4.59	....	....	....	6	N	
+ 88 59 50.05	4.60	....	....	....	5	..	
27 45 35.34	4.62	....	....	....	8	..	
+ 7 10 37.	....	....	....	....	..	N	
− 7 14 20.22	4.60	....	....	....	9	..	
+ 17 15 20.07	4.64	....	....	....	5	..	
33 30 22.68	4.65	+ 8.696	+ 0.297	− 0.450	6	..	
6 10 8.74	4.65	....	....	....	5	..	
+ 19 14 1.70	4.64	....	....	....	3	..	
+ 47 59 45.23	4.65	+ 9.888	+ .223	− 0.108	6	..	
+ 16 48 45.08	4.65	+ 10.009	+ .334	− 0.408	5	..	
− 1 6 12.77	4.64	....	....	....	4	..	
+ 46 27 10.77	4.66	....	....	....	4	..	
77 25 32.0.	4.62	....	....	....	1	..	
+ 39 57 8.36	4.65	....	....	....	5	..	
48 53 33.74	4.65	+ 12.061	+ .211	− 0.005	5	..	
48 51 58.44	4.65	+ 12.091	+ .212	− 0.033	5	..	
38 18 21.22	4.65	+ 12.553	+ .252	− 0.183	6	..	
44 56 26.34	4.66	....	....	....	2	..	
+ 33 36 50.73	4.64	....	....	....	4	..	
− 9 20 24.28	4.63	....	....	....	4	..	
+ 80 11 46.73	4.66	....	....	....	3	..	
− 17 36 38.4.	4.67	....	....	....	1	N	
+ 33 45 4.88	4.65	+ 14.354	+ .246	− 0.040	6	..	

TABLE IV (Continued,.

Name of Star	Mag.₁	Screen	Mag.₂	Right Ascension 1905.0			Epoch 1900 +	Prec. 1905	Sec. Var. 1850	Proper Motion	No. of Obs.
				h	m	s		s	s	s	
ζ Cygni	3.4	I	6.3	21	8	53.543	4.64	....	....	....	4
τ Cygni	3.9	I	5.4		10	59.890	4.64	....	....	....	2
α Equulei	4.1	I	5.3		11	4.549	4.65	....	....	....	4
B. A. C. 7504	7.7	..	7.8		18	36.86.	4.27	....	....	....	11
β Aquarii	3.1	1	6.3		26	33.545	4.37	....	....	....	6
ξ Aquarii	4.8	I	7.6	21	32	41.728	4.64	....	....	....	2
74 Cygni	5.3	I	7.9		33	8.462	4.15	....	....	....	5
μ Cygni, *prec.*	4.7	I	7.5		39	53.622	3.82	+ 2.6593	+ 0.0058	+ 0.0218	4
π² Cygni	4.4	I	6.3		43	16.939	3.82	....	....	....	3
16 Pegasi	5.2	I	7.7		48	44.351	3.82	....	....	....	4
α Aquarii	3.2	II	6.3	22	0	54.339	3.82	....	....	....	2
ι Pegasi	4.0	I	6.0		2	35.279	3.83	....	....	....	3
π² Pegasi	4.5	..	4.5		5	46.019	3.82	....	....	....	3
Σ 2877	6.6	..	6.7		9	44.538	3.82	+ 2.8866	+ .0034	— .0072	5
33 Pegasi	6.5	..	6.2		19	5.204	3.82	2.8609	+ .0054	+ .0238	5
σ Aquarii	4.8	..	4.8	22	25	37.301	3.82	....	....	....	
α Lacertae	3.9	I	7.1		27	22.535	3.83	....	....	....	
η Aquarii	4.2	I	5.5		30	28.524	3.83	....	....	....	2
10 Lacertae	5.1	I	7.6		34	59.783	3.82	....	....	....	2
ζ Pegasi	3.7	I	6.2		36	43.430	3.82	....	....	....	2
OΣ 477	7.5	..	7.5	22	39	21.268	3.82	+ 2.6030	+ .0172	+ .0166	5
Σ 2944, *seq.*	7.0	..	7.0		42	56.384	3.82	3.1088	— .0047	— .0128	5
λ Aquarii	3.8	I	6.5		47	39.557	3.82	....	....	....	4
OΣ 536	6.6	..	6.8		53	46.110	3.82	3.0130	+ .0025	+ .0259	5
ο Andromedae	4.0	I	6.4		57	32.870	3.83	....	....	....	2

TABLE IV (Continued).

Declination 1905.0	Epoch 1900 +	Prec. 1905	Sec. Var. 1850	Proper Motion	No. of Obs.	Ephem.	Synonyms
° ′ ″		″	″	″			
+ 29 50 13.06	4.64	....	....	....	4	..	
37 38 22.43	4.64	...	....	....	2	..	
4 51 17.15	4.65	....	....	....	4	N	
+ 86 38 41.3.	4.29	....	....	....	9	C	
− 5 59 21.69	4.37	....	....	....	6	..	
− 8 16 49.79	4.66	....	....	....	3	..	
+ 39 59 11.40	4.10	....	....	....	6	..	
28 18 48.08	3.82	+ 16.417	+ 0.222	− 0.246	5	..	
48 52 11.33	3.82	....	....	....	4	..	
+ 25 28 40.47	3.82	....	....	....	4	..	
− 0 46 53.25	3.82	....	....	....	2	..	
+ 24 52 51.01	3.83	....	....	....	3	N	
32 42 42.39	3.82	....	....	....	3	..	
16 43 13.38	3.82	+ 17.772	+ .190	− 0.098	5	..	
+ 20 22 4.46	3.82	+ 18.136	+ .177	− 0.016	5	..	
− 11 9 51.24	3.82	....	....	....	2	..	
+ 49 47 38.30	3.83	....	....	....	3	..	7 Lacertae
− 0 36 26.26	3.83	....	....	....	2	..	
+ 38 43 20.43	3.82	....	....	....	2	..	
10 20 7.13	3.82	....	....	....	2	..	
+ 45 31 41.82	3.82	+ 18.818	+ .126	− 0.006	5	..	
− 4 43 18.96	3.82	+ 18.925	+ .146	− 0.305	5	..	
− 8 5 7.19	3.82	....	....	....	4	..	
+ 8 51 7.82	3.82	+ 19.217	+ .124	− 0.152	5	..	
+ 41 48 54.91	3.83	....	....	....	2	..	

TABLE IV (Continued).

Name of Star	$Mag._1$	Screen	$Mag._2$	Right Ascension 1905.0			Epoch 1900+	Prec. 1905	Sec. Var. 1850	Proper Motion	No. of Obs.
				h	m	s		s	s	s	
α Pegasi	3.2	II	5.4	23	0	1.669	3.82	....	....	....	2
60 Pegasi	6.4	..	6.3		7	12.432	3.82	+ 2.9212	+ 0.0114	— 0.0145	5
τ Pegasi	4.6	I	6.8		15	56.002	3.82	....	....	....	4
κ Piscium	5.2	..	5.2		22	3.76.	3.81	....	....	....	1
B. A. C. 8213	5.8	..	5.8		27	47.395	3.82	....	....	....	5
ι Piscium	4.3	I	5.6	23	35	3 834	3.82	....	....	....	4
Σ 3041, so. *seq.*	8.2	..	7.9		43	2.112	3.82	+ 3.0430	+ 0.0093	+ 0.0052	4
φ Pegasi	5.2	I	6.8		47	39.199	3.82	....	....	....	3
ω Piscium	4.2	I	7.1	23	54	25.939	3.82	....	....	....	3

TABLE IV (Continued).

Declination 1950.0	Epoch 1900 +	Prec. 1905	Sec. Var. 1850	Proper Motion	No. of Obs.	Ephem.	Synonyms
° ′ ″		″	″	″			
+ 14 41 37.69	3.82	....	....	....	2	..	
26 20 2.72	3.82	+ 19.518	+ 0.092	− 0.121	5	..	
23 13 12.83	3.82	....	....	....	5	..	
0 44 7.6.	3.81	....	....	....	1	N	
86 47 0.40	3.82	....	....	....	4	N	Br. 3147
+ 5 6 40.94	3.82	....	....	....	3	..	
16 31 41.75	3.82	+ 19.993	+ 0.030	− 0.064	4	..	
18 35 33.78	3.82	....	....	....	3	N	
+ 6 20 14.52	3.82	....	....	....	3	..	

ERRATA.

Page 284, γ Ophiuchi, 1907, Aug. 7. Insert reference number 18.

285, 1 Aquilae, 1907, Aug. 5. Insert reference number 18.

286, 2 Aquilae, 1907, Aug. 7. Insert reference number 18.

294. The reference numbers 2 and 3 should be interchanged.

310. B. D. $+ 64°$, 1253; under Prec., 1905, for $+0.2478$ read $+ 2.4781$.

See, also, page 237.